

UNICORD

KORG®

PROFESSIONAL MODULAR EFFECTS

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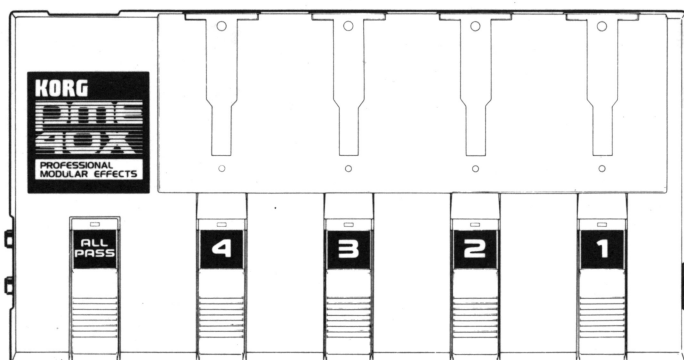
SERVICE MANUAL

PEDALBOARD

PME-40X

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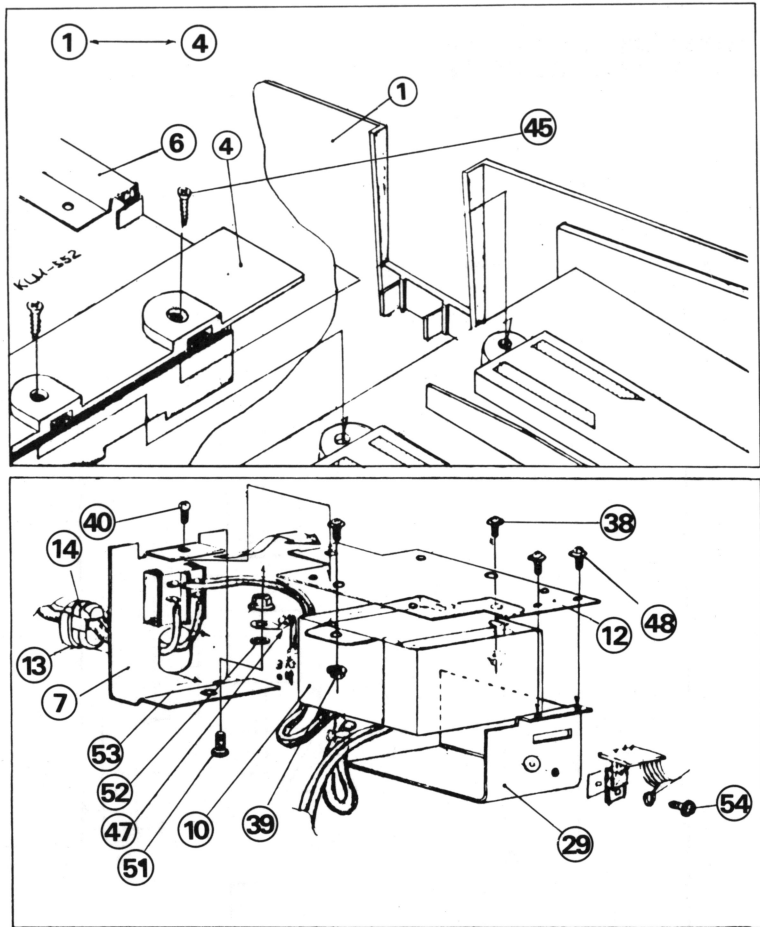
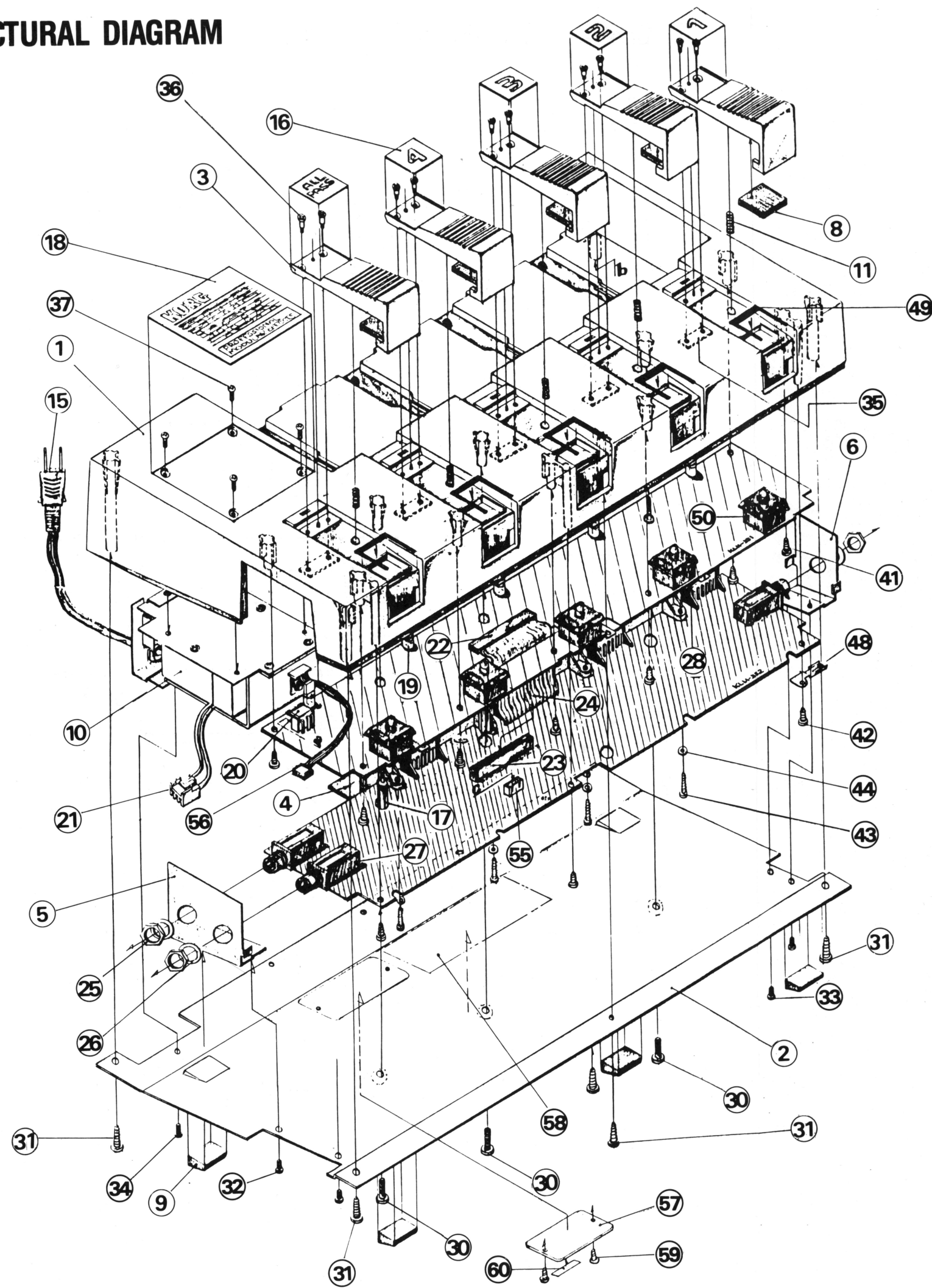
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1. SPECIFICATIONS

- **Input Impedance:** 1M Ω .
- **Output Impedance:** 1 k Ω .
- **Maximum Input Level:** Depends on the effect units.
- **Maximum Output Level:** Depends on the effect units.
- **Residual Noise:** -108 dBm, IHF-A, ALL PASS.
- **Frequency Response:** 20 Hz ~ 20 kHz, -1.5 ~ +0 dB, ALL PASS.
- **Functions:** INPUT, OUTPUT (R/MONO, L), POWER SW, EFFECT FOOT SW 1 ~ 4, EFFECT INDICATOR 1 ~ 4, ALL PASS FOOT SW, ALL PASS INDICATOR.
- **Power Consumption:** 8.5W MAX (This is the maximum power consumption when four effect units are used.) (KFL-402-2, KCH-301-2)
- **Power Supply:** Local Voltage.
- **Dimensions:** 369.5(W) x 56.0(H) x 190.5(D) mm.
- **Weight:** 1.8 kg Excl. Effect Units. (All values are typical.)

2. STRUCTURAL DIAGRAM



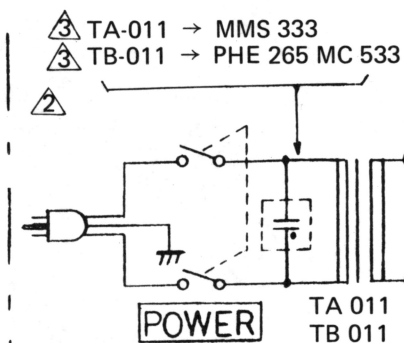
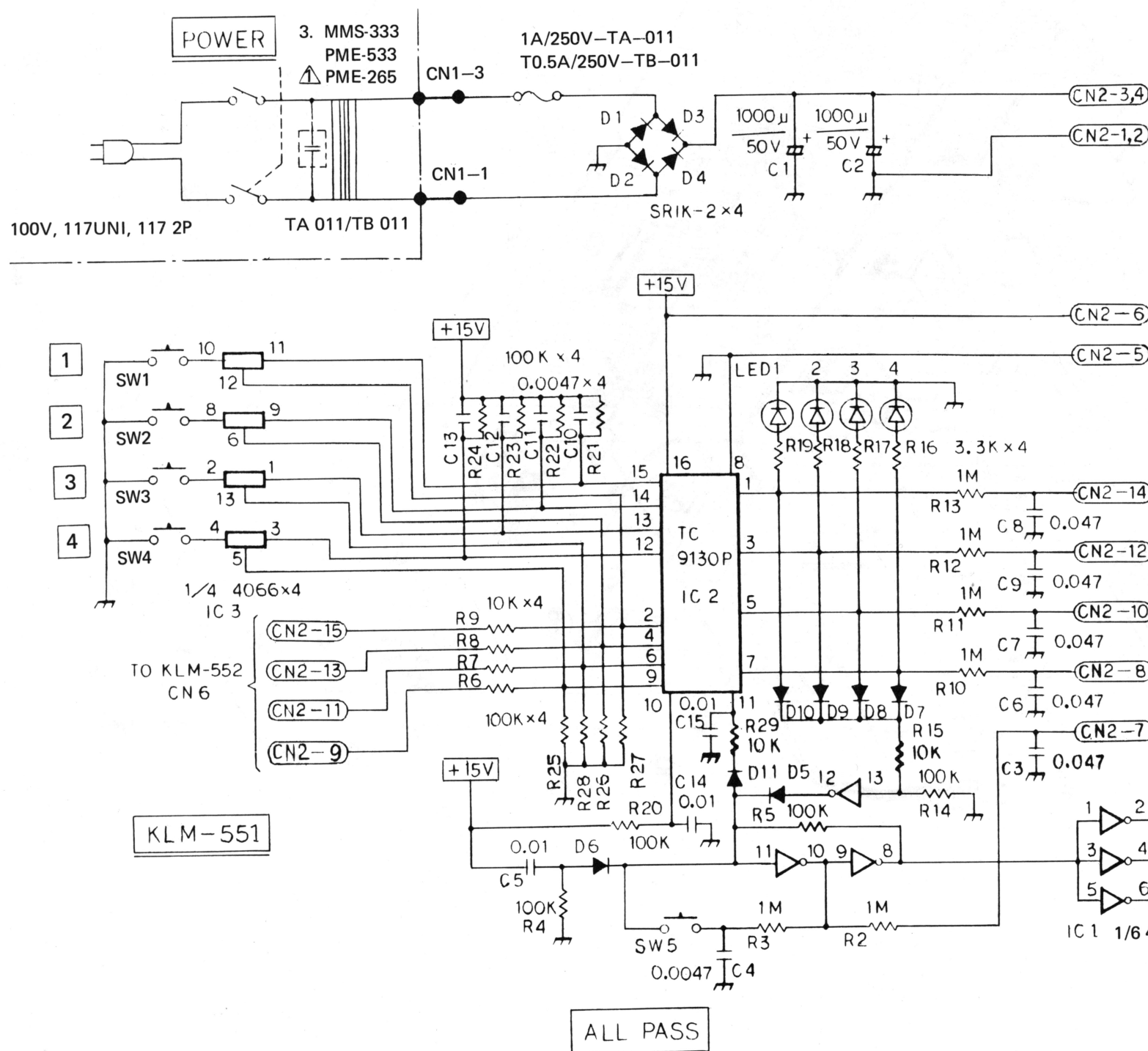
PART No.	PART NAME	REMARK
1.	SYSTEM CASE	KOC-E10009
2.	CHASSIS	KOC-C20128
3.	FOOT PEDAL	KOC-E30053
4.	CONNECTOR HOLDER	KOC-E20056
5.	PHONE JACK PLATE 2	KOC-C40494
6.	PHONE JACK PLATE 1	KOC-C40493
7.	REAR PANEL	KOC-C40492
8.	PEDAL CUSHION	KOC-F40259
9.	RUBBER FEET	KOC-F40257
10.	POWER TRANSFORMER	
11.	SPRING FOR PEDAL	KOC-C40489
12.	CHASSIS FOR POWER TRANSFORMER	KOC-40491
13.	POWER SW	
14.	BUSHING	
15.	AC CORD	
16.	SYSTEM SEAL	
17.	PC BOARD SUPPORT	KOC-C40490
19.	LED HOLDER	4x7x11
20.	CONNECTOR 3P	
21.	CONNECTOR 3P	
22.	CONNECTOR 15P	
23.	CONNECTOR 15P	
24.	FLAT CABLE	
25.	NUT	VM BZMC 12
26.	WASHER	WM BZMC 12x16.5x0.7
27.	PHONE JACK	
28.	8 PIN SOCKET	
29.	RADIATION BOARD	KOC-C40483
30.	SCREWS	FE B BZMC 4x8

PART No.	PART NAME	REMARK
31.	SCREWS	FLAX B BZMC 4x10
32.	SCREWS	FE B BZMC 3x6
33.	SCREWS	FE B BZMC 3x6
34.	SCREWS	FE B BZMC 3x6
35.	PEDAL SUPPORT	KOC-C40495
36.	PEDAL SCREWS	KOC-C40497
37.	SCREWS	FE B ZMC 3x6
38.	SCREWS	FE FEW ZMC 3x8
39.	SCREWS	FHN ZMC 3
40.	SCREWS	FE B ZMC 3x6
41.	SCREWS	PLAX B ZMC 3x8
42.	SCREWS	PLAX B ZMC 3x8
43.	SCREWS	PLAX B ZMC 3x8
44.	WASHER	PSW 3
45.	SCREWS	PLAX F BZMC 3x8
46.	SCREWS	FE FEW ZMC 3x8
47.	LUG	
48.	GND TERMINAL	KOC-C40499
49.	PEDAL SPACER	KOC-F40260
50.	PUSH SW	JM-0411 #07
51.	SCREWS	FE B BZMC 3x8
52.	WASHER	TWU ZMC 4
53.	NUT	FHN ZMC 4
54.	SCREWS	FE B ZMC 3x8
55.	CONNECTOR (PLUG)	
56.	CONNECTOR (SOCKET)	
57.	MODEL NUMBER PLATE	KOC-C40502
58.	REAR PANEL SEAL	KOC-F40103
59.	SCREWS	TP2G B BZMC 3x6
60.	SERIAL NUMBER SEAL	

The diagram illustrates a stereo system with a protection circuit. The main components and their connections are as follows:

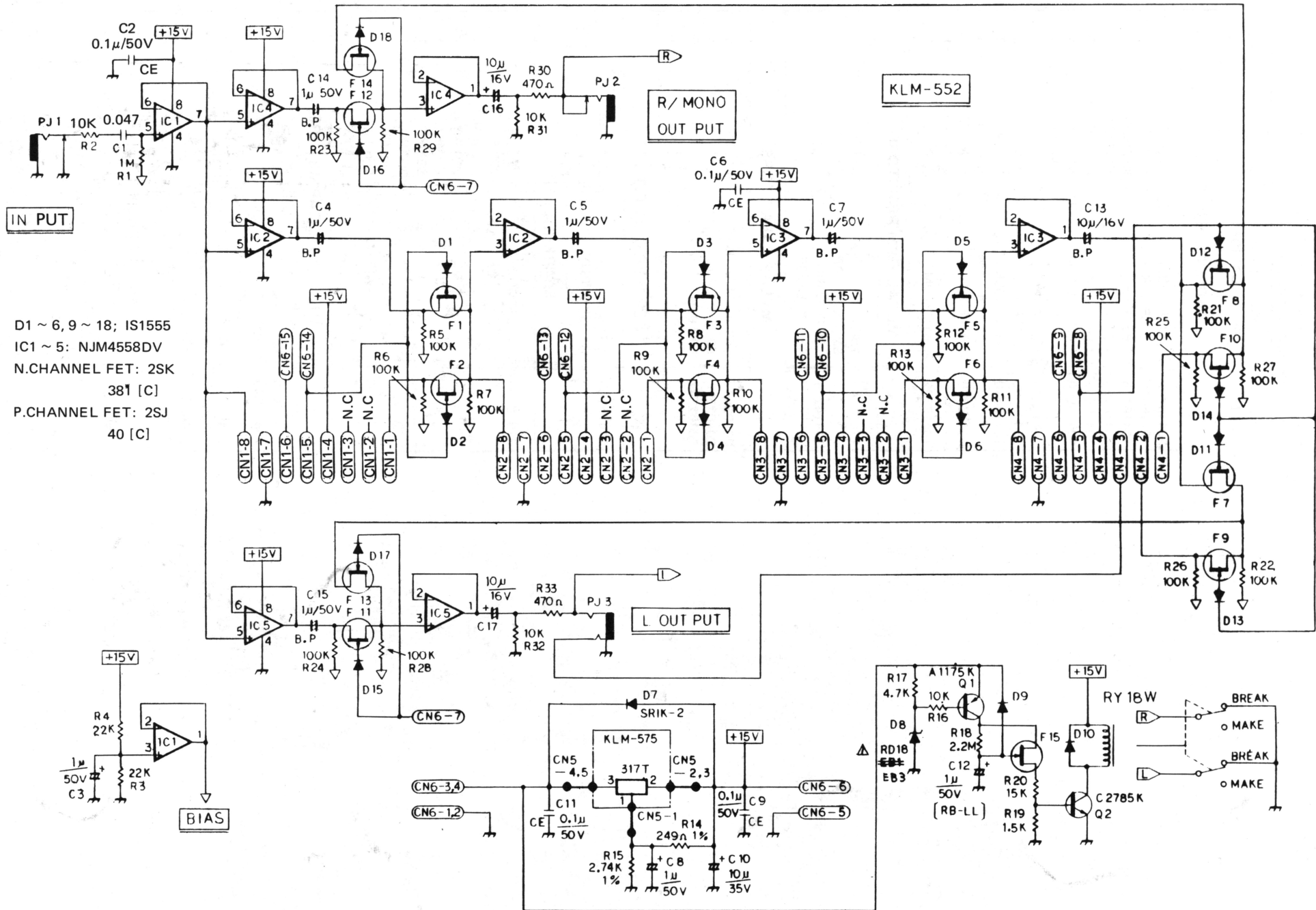
- Input Section:** A 'SEND' input is connected to a 'Buffer'. The output of this buffer goes to a switch controlled by SW1. The switch can route the signal to either a 'Buffer' (leading to 'R/MONO OUTPUT') or to a 'STEREO RETURN' point.
- Signal Path:** The signal continues through a series of buffers and switches, controlled by SW2, SW3, SW4, and SW5. These switches can route the signal to either the next buffer or to the 'STEREO RETURN' point.
- Control Logic:** A central 'CONTROL LOGIC CIRCUIT' block receives an 'ENABLE' signal. It controls the five switches (SW1-SW5) and five LEDs (LED1-LED5). The LEDs are color-coded: LED5 is Green, and LEDs 1-4 are Red. The circuit also has a 'SW CONTROL OUT' output.
- Protection Circuit:** A 'PROTECTION' block is connected to a 'RELAY'. The relay can disconnect the outputs from the signal path.
- Power Supply:** The system is powered by a +15V supply, with GND and N.C. (Not Connected) connections.

4. CIRCUIT DIAGRAM KLM-551

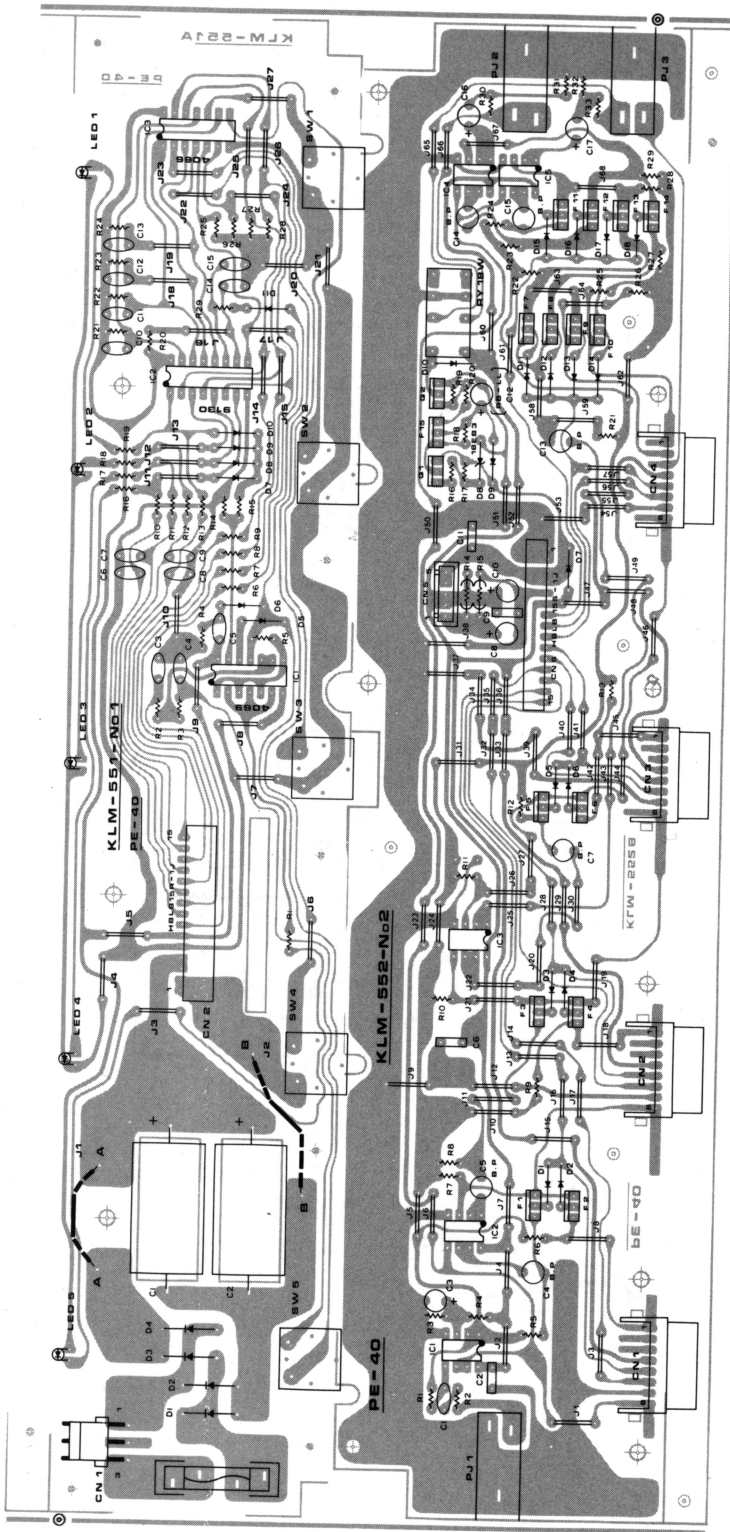


TO KLM 552
CN6

D5~11:1S1555
LED1~4:SLP-162B [RED]
LED5:SLP-262B [GREEN]



5. PC BOARD



6. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS			
10416347	1/6JTP 470Ω	KLM-552	2
10416410	1/6JTP 1.0K	KLM-551	1
10416415	1/6JTP 1.5K	KLM-552	1
10416433	1/6JTP 3.3K	KLM-551	4
10416447	1/6JTP 4.7K	KLM-552	1
10416510	1/6JTP 10K	KLM-551	6
		KLM-552	4
10416515	1/6JTP 15K		1
10416522	1/6JTP 22K		2
10416610	1/6JTP 100K	KLM-551	12
		KLM-552	18
10416710	1/6JTP 1.0M	KLM-551	6
		KLM-552	1
10416722	1/6JTP 2.2M		1
METAL FILM RESISTORS			
12413249	1/4TP 249Ω	KLM-552	1
12414274	SN14K2ET26F 1/4TP 2.74K SN14K2ET26F		1
MYLAR CAPACITORS			
20402447	50V 0.0047μF K	KLM-551	5
20402510	50V 0.01μF K		3
20402547	50V 0.047μF K	KLM-552	5
			1
CERAMIC CAPACITORS			
21415100	50V 0.1μF RTDSKE11SJY5V104Z	KLM-552	4
SPARK KILLER			
21900300	PME265MC 533	220 GE	1
		220 SE	1
		240 AF	1
		240 AU	1
		DEMKO	1
		SEMKO	1
		NEMKO	1
		240 GE	1
		220 FR	1
		FEMKO	1
ELECTROLYTIC CAPACITORS			
23615410	50V 1000μF TE	KLM-551	2
25403210	15V 10μF RE•T2	KLM-552	2
25405210	35V 10μF RE•T2		1
25406110	50V 1μF RE•T2		2
25426110	50V 1μF RB-LL•T2		1
25463210	16V 10μF RBP•T2		1
25466110	50V 1μF RBP•T2		5
MMS CAPACITOR			
27009533	125V 0.033μF M	UNI	1
		JAM	1
		117 2P	1

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
TRANSISTORS			
30400020	2SA1175 K TN	KLM-552	1
30420020	2SC2785 K TN		1
FET			
30460021	2SK381-34-C	KLM-552	8
30460110	2SJ40-34-C		7
DIODE			
31001500	SR1K-2	KLM-552	1
31400100	1S1555 TP	KLM-551	4
		KLM-552	7
			16
ZENER DIODE			
31421600	RD-18-T1-B3	KLM-552	1
LED			
31203000	SLP 162B RED	KLM-551	4
31203100	SLP 262B GREEN		1
IC			
32003004	TC-9130 P	KLM-551	1
32004004	HD-14066 BP		1
32004019	HD-14069 UBP		1
32009001	NJM-4558D-V	KLM-552	5
32020043	LM-317T		1
P.C. BOARD (without parts)			
34055101	KLM-551A/2B TP		1
34057500	KLM-575		1
PUSH SW			
37505500	JM-0411#07	KLM-551	5
POWER SW			
37505600	1802-0124		1
POWER TRANSFORMER			
40008700	TA-011	UNI	1
		JAM	1
		117 2P	1
		100V	1
40008800	TB-011	220 GE	1
		220 SE	1
		240 AF	1
		240 AU	1
		DEMKO	1
		SEMKO	1
		NEMKO	1
		240 GE	1
		220 FR	1
		FEMKO	1

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
RELAY			
40300600	RY18W	KLM-552	1
PHONE JACK			
45402000	HLJ0520-01-110	KLM-552	2
45402100	HLJ0520-01-010		1
FUSE			
46412003	250V 1.0A UL	100V UNI	1
		JAM	1
		117 2P	1
46461701	250V T500MA	220 GE	1
		220 SE	1
		240 AF	1
		240 AU	1
		DEMKO	1
		SEMKO	1
		NEMKO	1
		240 GE	1
		220 FR	1
		FEMKO	1
HARNESS			
47039100	HNS-291		1
CONNECTOR			
47130500	B5B-XHA (TOP)	KLM-552	1
47241500	HBLB15R-1J	KLM-551	1
47241600	HBLB15S-1J	KLM-552	1
47250300	B3PS-VH (SIDE)	KLM-551	1
8 PIN SOCKET			
47408200	XI-2342#01	KLM-552	4
RUBBER FEET			
50008200	KOC-F40257	KLM-552	5
PEDAL CUSHION			
50008300	KOC-F40259	KLM-552	5
PEDAL SPACER			
50008400	KOC-F40260	KLM-552	5
FUSE HOLDER			
51501600	S-N5053#01	KLM-551	2
BUSHING			
54000300	SR-4K-4	UNI	1
		117 2P	1
		100V	1
54000400	SR-5P-4	JAM	1
		240 AU	1

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
54000500	SR-6W-1	220 GE 220 SE 240 AF DEMKO SEMKO NEMKO 240 GE 220 FR FEMKO	1 1 1 1 1 1 1 1 1
CAPACITOR COVER (SQUARE)			
54006700	No. 820836		1
WIRE BAND			
54007200	PLT-1M		2
AC CORD BAND			
54007600	No. 113		1
FLAT CABLE			
54520090	SMCD-15x85-BDx10		1
RADIATION BOARD			
56002900	KOC-C40483		1
SHIELDING SHEET			
56500300	BFG-30		1
ISOLATION TUBE			
56590001	B-17		1
LED HOLDER			
57503300	4x7x11	KLM-551	5
FUSE SEAL			
58000301	250VT 0.5A F40184	220 GE 220 SE 240 AF 240 AU DEMKO SEMKO NEMKO 240 GE 220 FR FEMKO	1 1 1 1 1 1 1 1 1 1
FUSE CAUTION SEAL			
58001800	KOC-F30013		1

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
GND SEAL			
58001900	KOC-F40058	JAM 220 GE 220 SE 240 AF 240 AU DEMKO SEMKO NEMKO 240 GE 220 FR FEMKO	1 1 1 1 1 1 1 1 1 1 1
WIRING CAUTION			
58004000	NO1 KOC-F40082	240 GE	1
REAR PANEL SEAL			
58005300	KOC0F40103		1
FUSE SEAL			
58013300	250V 1.0A KOC-F40185	UNI JAM 117 2P 100V	1 1 1 1
PANEL SEAL			
58018700	KOC-F40264	UNI JAM 117 2P 220 GE 220 SE 240 AF 240 AU DEMKO SEMKO NEMKO 240 GE 220 FR FEMKO	1 1 1 1 1 1 1 1 1 1 1 1 1
AC CORD			
60000201	SPT-2 18AWG SU426-58	UNI	1
60000301	CLASS1 (SU429058)	117 2P 220 GE DEMKO SEMKO NEMKO 240 GE FEMKO	1 1 1 1 1 1 1
60000401	SAA (SU428-58)3X.75	240 AU	1
60000501	BS (SU431A-58)	240 AF	1
60000601	SVT (SU427-58) 3x18AWG	JAM	1
60000901	SEV (SU430-58)	220 SE	1
60001301	KP-4819D GTCE-3 .75	220 FR	1

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
P.C. BOARD SUPPORT			
64061200	KOC-C40490		3
SPRING FOR PEDAL			
64061300	KOC-C40489		5
PEDAL SUPPORT			
64061400	KOC-C40495		5
SHASSIS			
64061500	KOC-C20128		1
PHONE JACK PLATE			
64061600	1 KOC-C40493		1
64061700	2 KOC-C40494		1
REAR PANEL			
64061800	KOC-C40492		1
SHASSIS FOR POWER TRANSFORMER			
64061900	KOC-C40491		1
GND TERMINAL			
64062500	KOC-C40499		1
SYSTEM CASE			
64614200	KOC-E10009		1
CONNECTOR HOLDER			
64614400	KOC-E20056		1
FOOT PEDAL			
64614500	KOC-E30053		5
LUG 4φ			
67200200		JAM 220 GE 220 SE 240 AF 240 AU DEMKO SEMKO NEMKO 240 GE 220 FR FEMKO	1 1 1 1 1 1 1 1 1 1 1 1
SERIAL NUMBER SEAL			
68599999			1

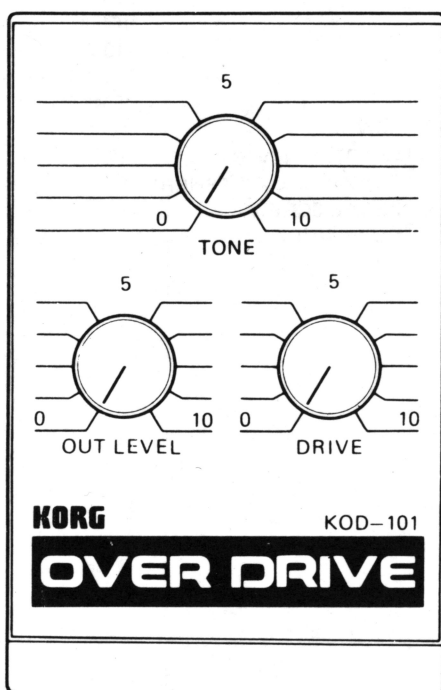
PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
MODEL NUMBER PLATE			
68600700	KOC-C40424	UNI JAM 117 2P 220 GE 220 SE 240 AF 240 AU 240 GE 220 FR	1 1 1 1 1 1 1 1 1
68600900	KOC-C40479	DEMKO SEMKO NEMKO FEMKO	1 1 1 1
SCREWS, NUTS, WASHERS (PLEASE REFER TO STRUCTURAL DIAGRAM)			
70560306	FE B BZMC 3x6		10
70560408	FE B BZMC 4x8		4
70730308	FE FEW ZMC 3x8		4
72560306	TP2G B BZMC 3x6		2
74160308	PLAX F BZMC 3x8		4
74530308	PLAX B ZMC 3x8		14
74560410	PLAX B BZMC 4x10		5
77030300	FHN ZMC 3		3
77030400	FHN ZMC 4		1
77361200	VN BZMC 12		3
78430400	TWU ZMC 4	JAM 220 GE 220 SE 240 AF 240 AU DEMKO SEMKO NEMKO 240 GE 220 FR FEMKO	1 1 1 1 1 1 1 1 1 1 1
78500300	PCW 3		5
79071217	WM BZMC 12x16.5x0.7 (PHONE JACK WASHER)		3
79120001	PEDAL SCREWS KOC-C40497		10

OVER DRIVE

KOD-101

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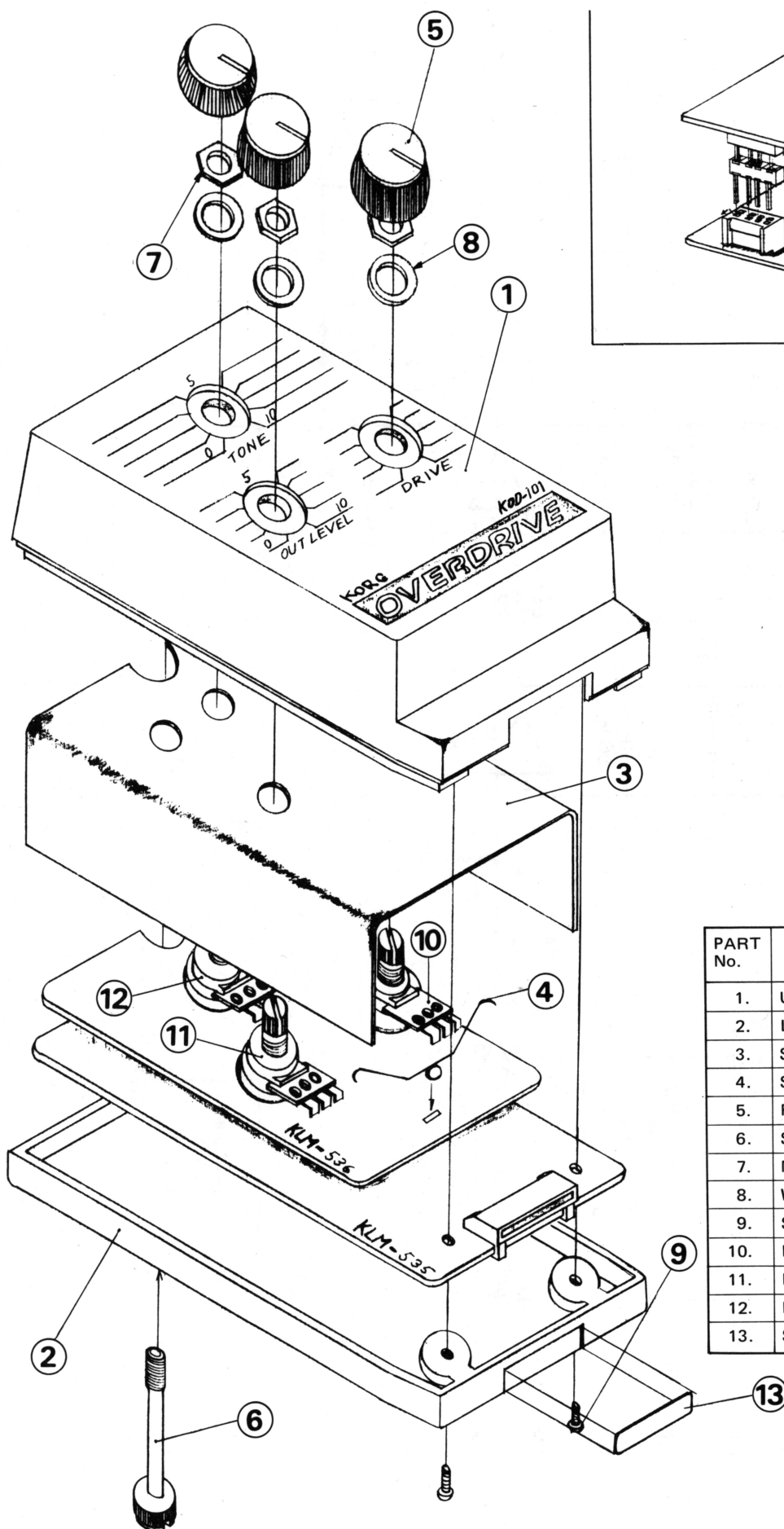
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1. SPECIFICATIONS

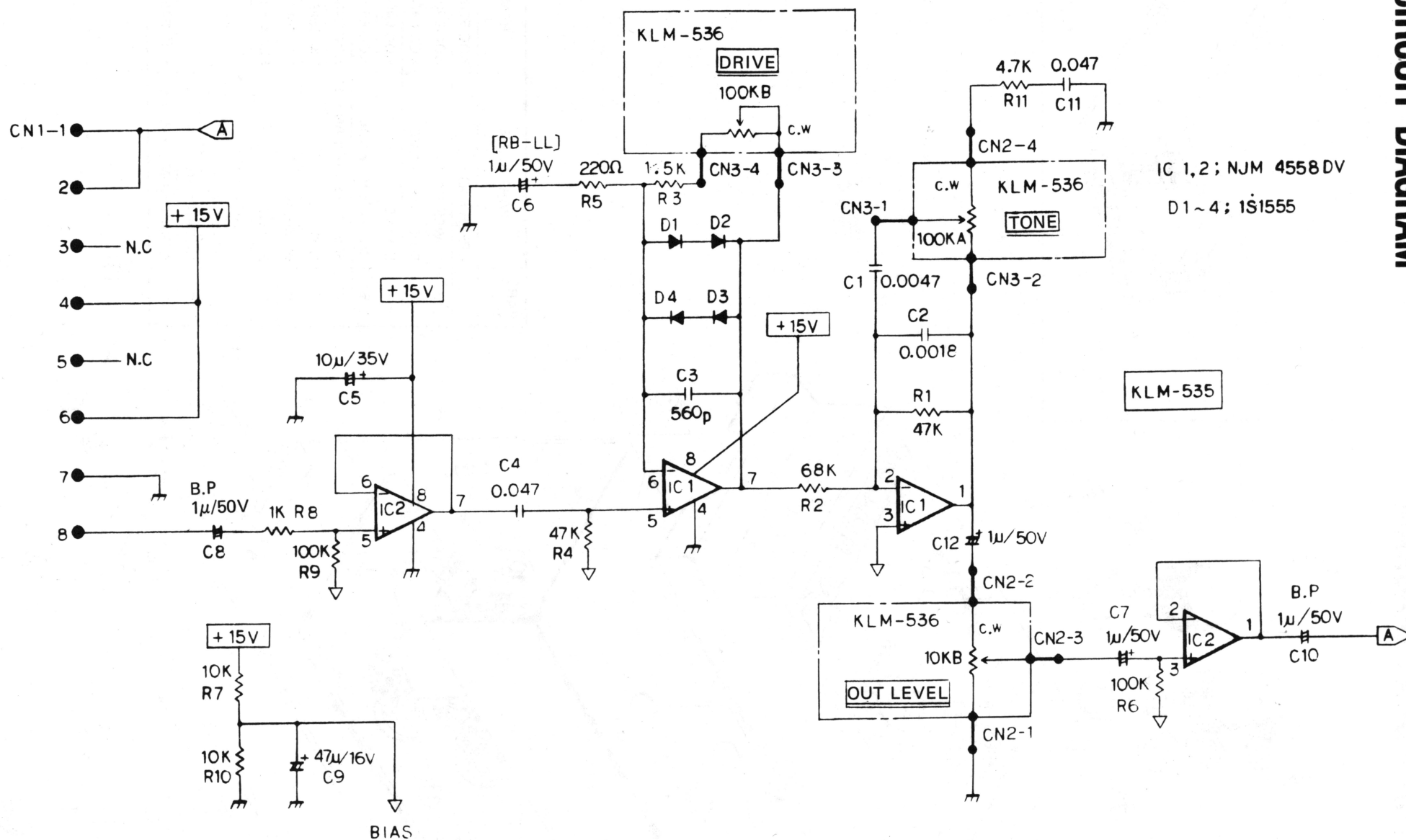
- **Maximum Output Level:** 5 V P-P/at 1 kHz.
- **Gain Control:** 43 dB MAX/at 1 kHz. TONE 10.
- **Tone Control:** -5 dB +0 dB/at 1 kHz, TONE 0 ~ 10.
- **Noise Level:** -110 dBm equivalent input noise IHF-A.
- **Power Consumption:** 9 mA.
- **Functions:** DRIVE, TONE, OUT LEVEL.
- **Power Supply:** DC 15 V (DC is supplied from the Pedal-board).
- **Dimensions:** 68.0(W) x 56.5(H) x 106.5(D) mm.
- **Weight:** 190 g. (All values are typical).

2. STRUCTURAL DIAGRAM

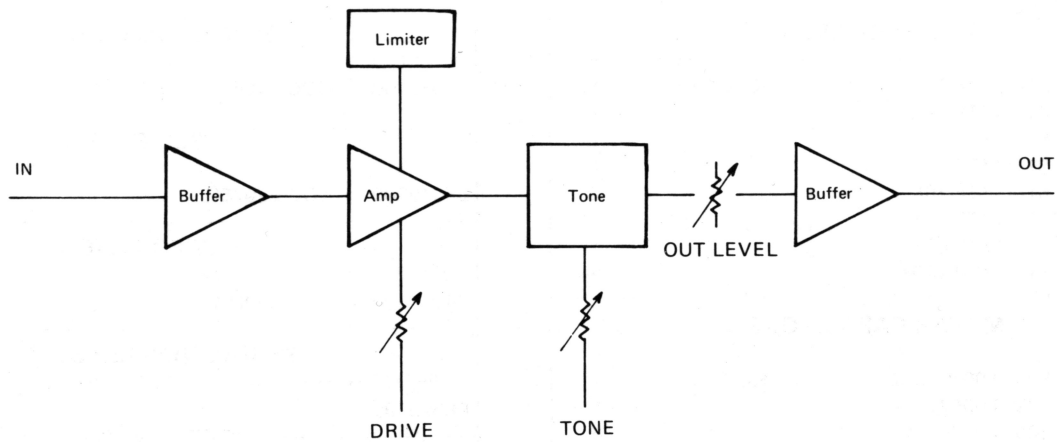


PART No.	PART NAME	REMARKS
1.	UPPER CASE	KOC-E20058
2.	LOWER CASE	KOC-E20062
3.	SHIELDING COVER	KOC-C40485
4.	SPRING	KOC-C40484
5.	ROTARY VR KNOB	KOC-E40138
6.	SPECIAL SCREW BN M4	KOC-C40488
7.	NUT	VM ZMC 7
8.	WASHER	WM ZMC 7
9.	SCREWS	PLAX B BZMC 3x10
10.	ROTARY VR	
11.	ROTARY VR	
12.	ROTARY VR	
13.	SERAIL NUMBER SEAL	KOC-F40050

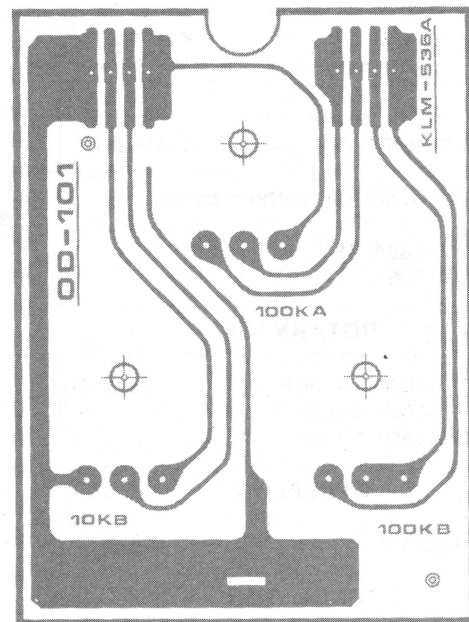
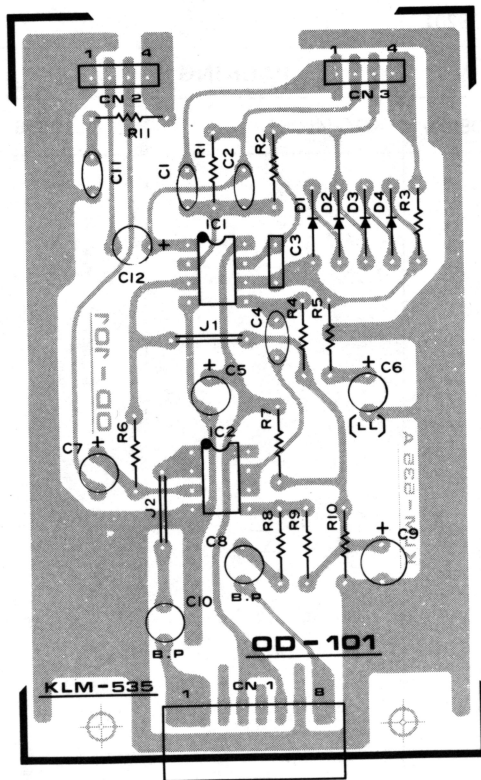
3. CIRCUIT DIAGRAM



4. BLOCK DIAGRAM



5. PC BOARD



6. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS			
10413322	S1/4JYTP 220Ω	KLM-535	1
10413410	S1/4JYTP 1K		1
10413415	S1/4JYTP 1.5K		1
10413447	S1/4JYTP 4.7K		1
10413510	S1/4JYTP 10K		2
10413547	S1/4JYTP 47K		2
10413568	S1/4JYTP 68K		1
10413610	S1/4JYTP 100K		2
MYLAR CAPACITORS			
20402418	50V 0.0018μF K	KLM-535	1
20402447	50V 0.0047μF K		1
20402547	50V 0.047μF K		2
CERAMIC CAPACITOR			
21443560	50V 560PF	KLM-535	1
ELECTROLYTIC CAPACITORS			
25403247	16V 47μF RE•T2	KLM-535	1
25405210	35V 10μF RE•T2		1
25406110	50V 1μF RE•T2		2
25426110	50V 1μF RB-LL•T2		1
25466110	50V 1μF RBP•T2		2
DIODE			
31400100	1S1555 TP	KLM-535	4
IC			
32009001	NJM-4558D-V	KLM-535	2
P.C. BOAD (without parts)			
34053501	KLM-535A TP		1
34053601	KLM-536		1
ROTARY VR			
36015900	K161100P7E-100KB	KLM-536	1
36016300	K161100P7E-100KA		1
36016500	K161100P7E-10KB		1
8 PIN PLUG			
47408100	XI-2343#01	KLM-535	1
CONNECTOR			
47408301	WD-2104#01	KLM-536	2
47408600	SB4P-HVQ-55W JST	KLM-535	2
ROTARY VR KNOB			
62012000	KOC-E40138		3
SPRING			
64062000	KOC-C40484	KLM-536	1

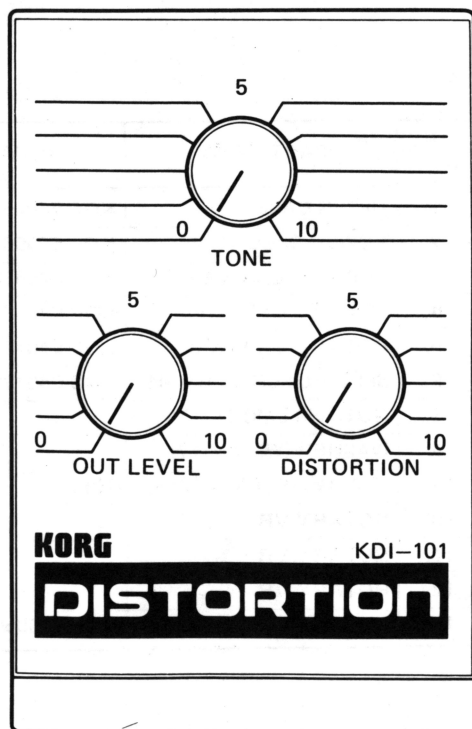
PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
SHIELDING COVER			
64062200	KOC-C40485		1
UPPER CASE			
64612800	KOC-E20058		1
LOWER CASE			
64614600	KOC-E20062		1
SERIAL NUMBER SEAL			
68599999			1
SCREWS, NUTS, WASHERS (PLEASE REFER TO STRUCTURAL DIAGRAM)			
74560310	PLAX B BZMC 3x10		2
77330701	VN ZMC 7		3
78030700	WM ZMC 7		3
79120000	BN M4 KOC-C40488		1
DISPLAY CARD			
80008200			1
CLEAR PLASTIC FRONT			
80008201			1
PACKING PAD			
80008230	KOC-I40061	KLM-536	1

DISTORTION

KDI-101

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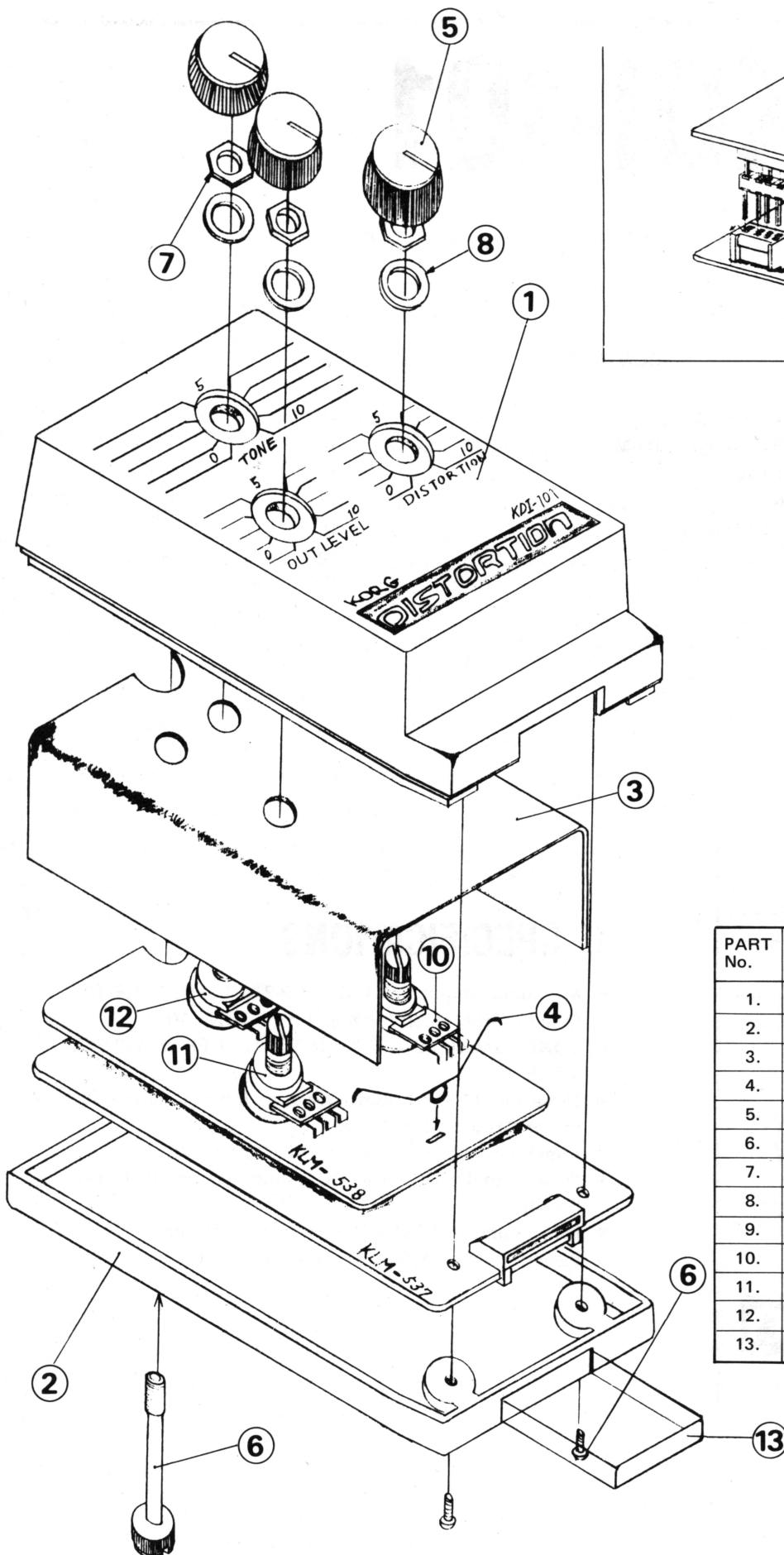
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1. SPECIFICATIONS

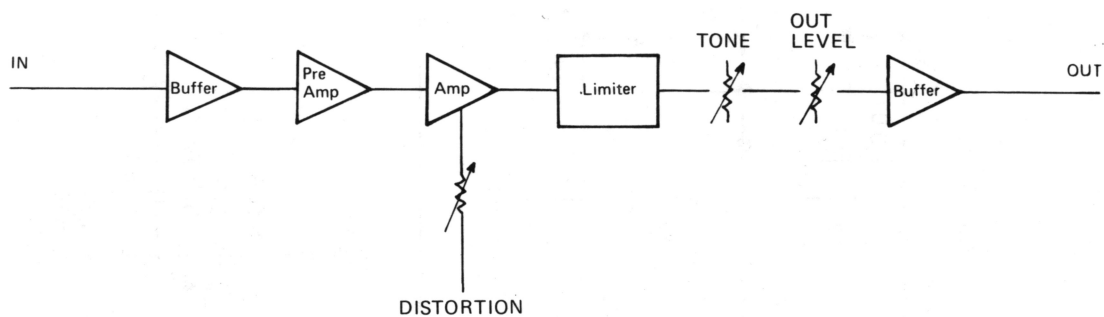
- **Maximum Output Level:** 0.8 V P-P/at 1 kHz, TONE 10.
- **Gain Control:** 48 dB MAX/at 1 kHz, TONE 10.
- **TONE Control:** PEAK 2.5 kHz/TONE 10, PEAK 360 Hz/TONE 0.
- **Noise Level:** -108 dBm equivalent input noise IHF-A.
- **Power Consumption:** 8 mA.
- **Functions:** DISTORTION, TONE, OUT LEVEL.
- **Power Supply:** DC 15 V (DC is supplied from the Pedal-board).
- **Dimensions:** 68.0(W) x 56.5(H) x 106.5(D) mm.
- **Weight:** 190 g. (All values are typical).

2. STRUCTURAL DIAGRAM

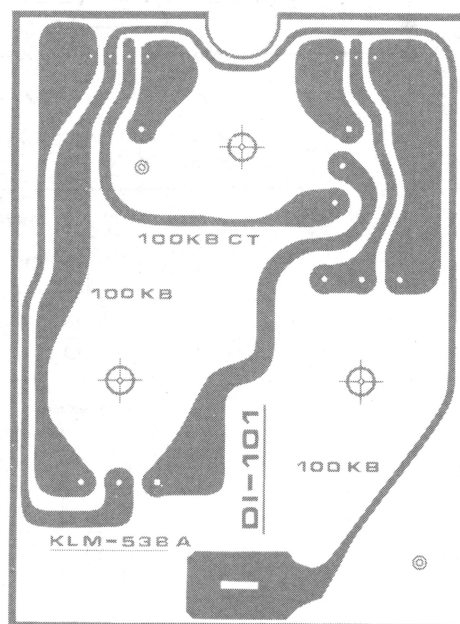
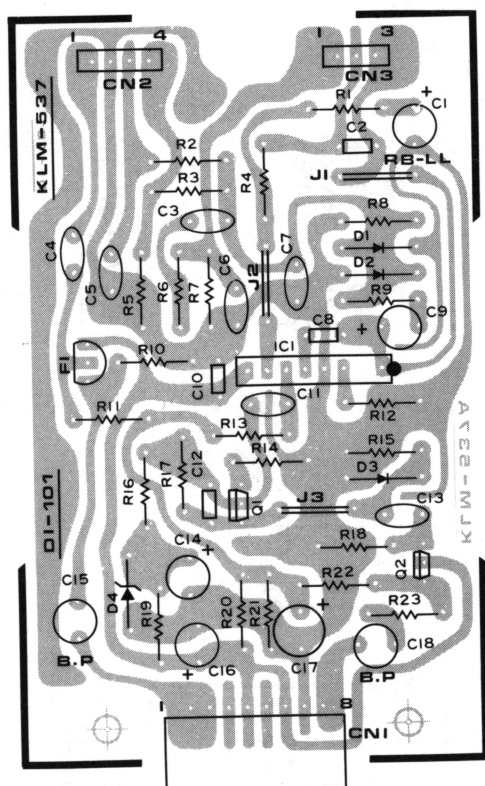


PART No.	PART NAME	REMARK
1.	UPPER CASE	KOC-E20058
2.	LOWER CASE	KOC-E20062
3.	SHIELDING COVER	KOC-C40485
4.	SPRING	KOC-C40484
5.	ROTARY VR KNOB	KOC-E40138
6.	SPECIAL SCREW BN M4	KOC-C40488
7.	NUT (VM ZMC 7)	
8.	WASHER (WM ZMC 7)	
9.	SCREWS (PLAX B BZMC 3x10)	
10.	ROTARY VR	
11.	ROTARY VR	
12.	ROTARY VR	
13.	SERIAL NUMBER SEAL	KOC-F40050

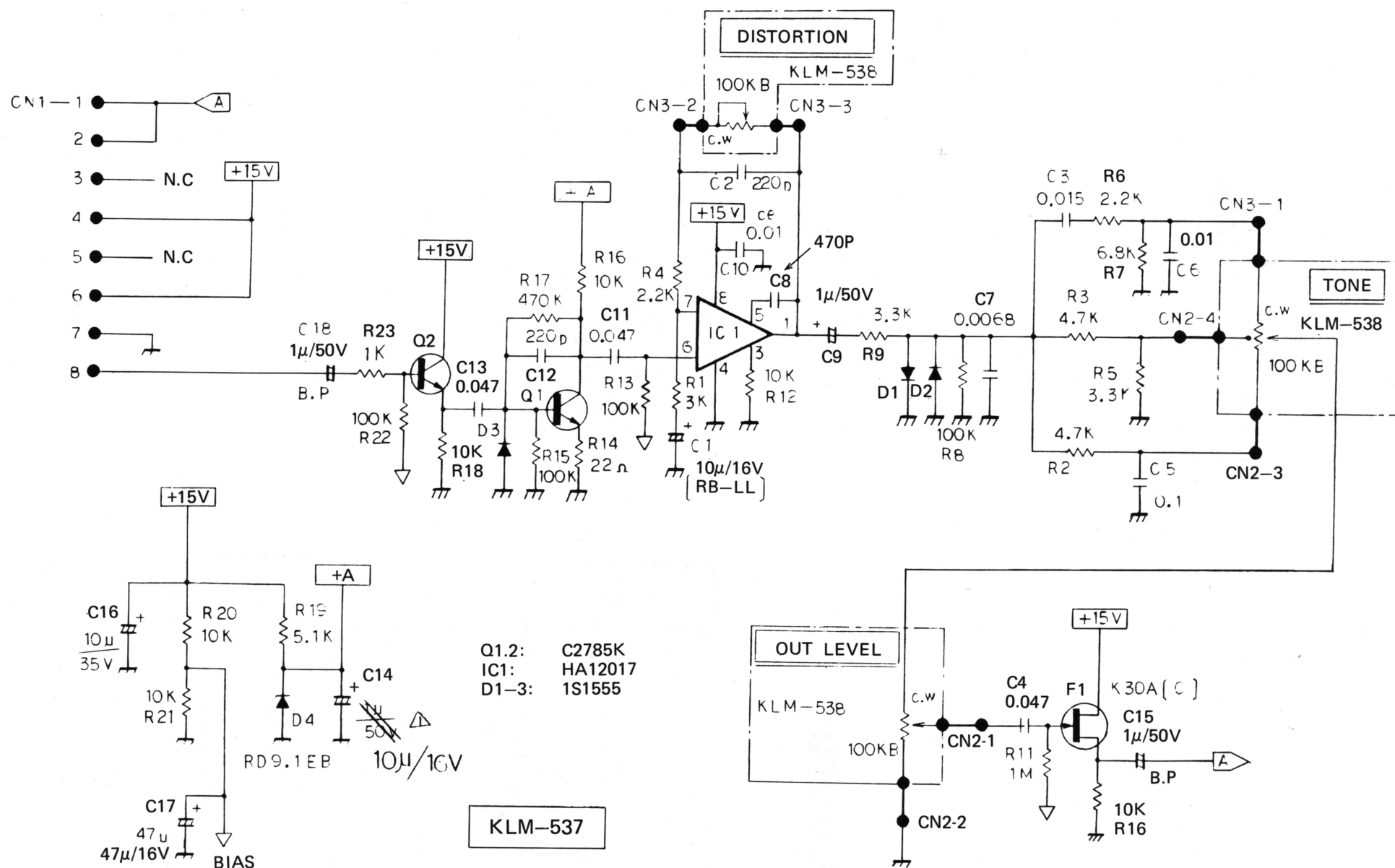
3. BLOCK DIAGRAM



4. PC BOARD



5. CIRCUIT DIAGRAM



6. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS			
10413222	S1/4JYTP 22Ω	KLM-537	1
10413410	S1/4JYTP 1K		1
10413422	S1/4JYTP 2.2K		2
10413430	S1/4JYTP 3K		1
10413433	S1/4JYTP 3.3K		2
10413447	S1/4JYTP 4.7K		2
10413451	S1/4JYTP 5.1K		1
10413468	S1/4JYTP 6.8K		1
10413510	S1/4JYTP 10K		6
10413610	S1/4JYTP 100K		4
10413647	S1/4JYTP 470K		1
10413710	S1/4JYTP 1M		1
MYLAR CAPACITORS			
20402468	50V 0.0068μF K	KLM-537	1
20402510	50V 0.01μF K		1
20402515	50V 0.015μF K		1
20402547	50V 0.047μF K		3
20402610	50V 0.1μF K		1
CERAMIC CAPACITORS			
21443220	50V 220PF	KLM-537	2
21443470	50V 470PF		1
21445100	50V 0.01μF		1
ELECTROLYTIC CAPACITORS			
25403210	16V 10μF RE•T2	KLM-537	1
25403247	16V 47μF RE•T2		1
25405210	35V 10μF RE•T2		1
25406110	50V 1μF RE•T2		1
25423210	16V 10μF RB-LL•T2		1
25466110	50V 1μF RBP•T2		2
TRANSISTOR			
30420020	2SC2785 K TN	KLM-537	2
FET			
30460010	2SK30A TM-O TNE-2	KLM-537	1
DIODE			
31400100	1S1555 TP	KLM-537	3
ZENER DIODE			
31421200	RD-9.1-T1-B1	KLM-537	1
IC			
32004062	HA-12017	KLM-537	1
P.C. BOARD (without parts)			
34053701	KLM-537 TP		1
34053801	KLM-538		1

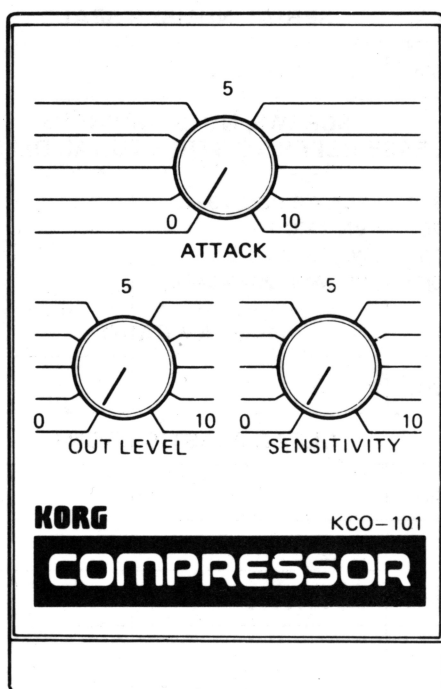
PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
ROTARY VR			
36015900 36016000	K161100P7E-100KB K161100PDE-100KB	KLM-538	2 1
8 PIN PLUG			
47408100	XI-2343#01	KLM-537	1
CONNECTOR			
47408300 47408301 47408500 47408600	WD-2103#01 WD-2104#01 SB3P-HVQ-55W JST SB4P-HVQ-55W JST	KLM-538 KLM-537	1 1 1 1
ROTARY VR KNOB			
62012000	KOC-E40138		3
SPRING			
64062000	KOC-C40484	KLM-538	1
SHIELDING COVER			
64062200	KOC-C40485		1
UPPER CASE			
64613000	KOC-E20058		1
LOWER CASE			
64614600	KOC-E20062		1
SERIAL NUMBER SEAL			
68599999			1
SCREWS, NUTS. WASHERS (PLEASE REFER TO STRUCTURAL DIAGRAM)			
74560310 77330701 78030700 79120000	PLAX B BZMC 3x10 VN ZMC 7 WM ZMC 7 BN M4 KOC-C40488		2 3 3 1
DISPLAY CARD			
80008200			1
CLEAR PLASTIC FRONT			
80008201			1
PACKING PAD			
80008230	KOC-I40061		1

COMPRESSOR

KCO-101

CONTENTS

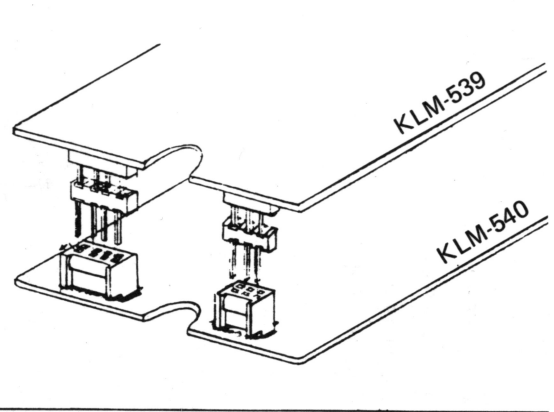
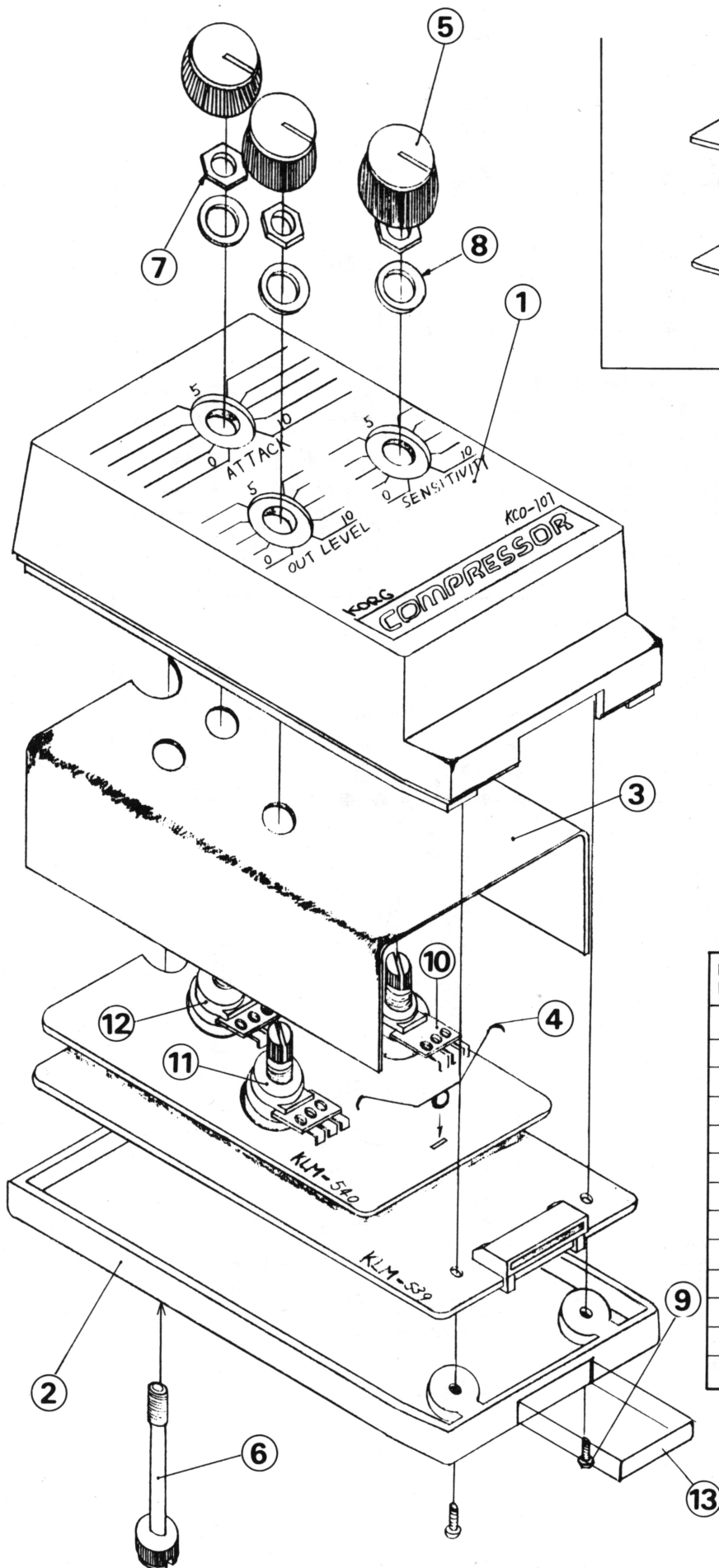
1. SPECIFICATIONS	20
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3. CIRCUIT DIAGRAM	22
4. BLOCK DIAGRAM	23
5. ADJUSTMENT PROCEDURE	23
6. PC BOARD	23
7. PARTS LIST	24



1. SPECIFICATIONS

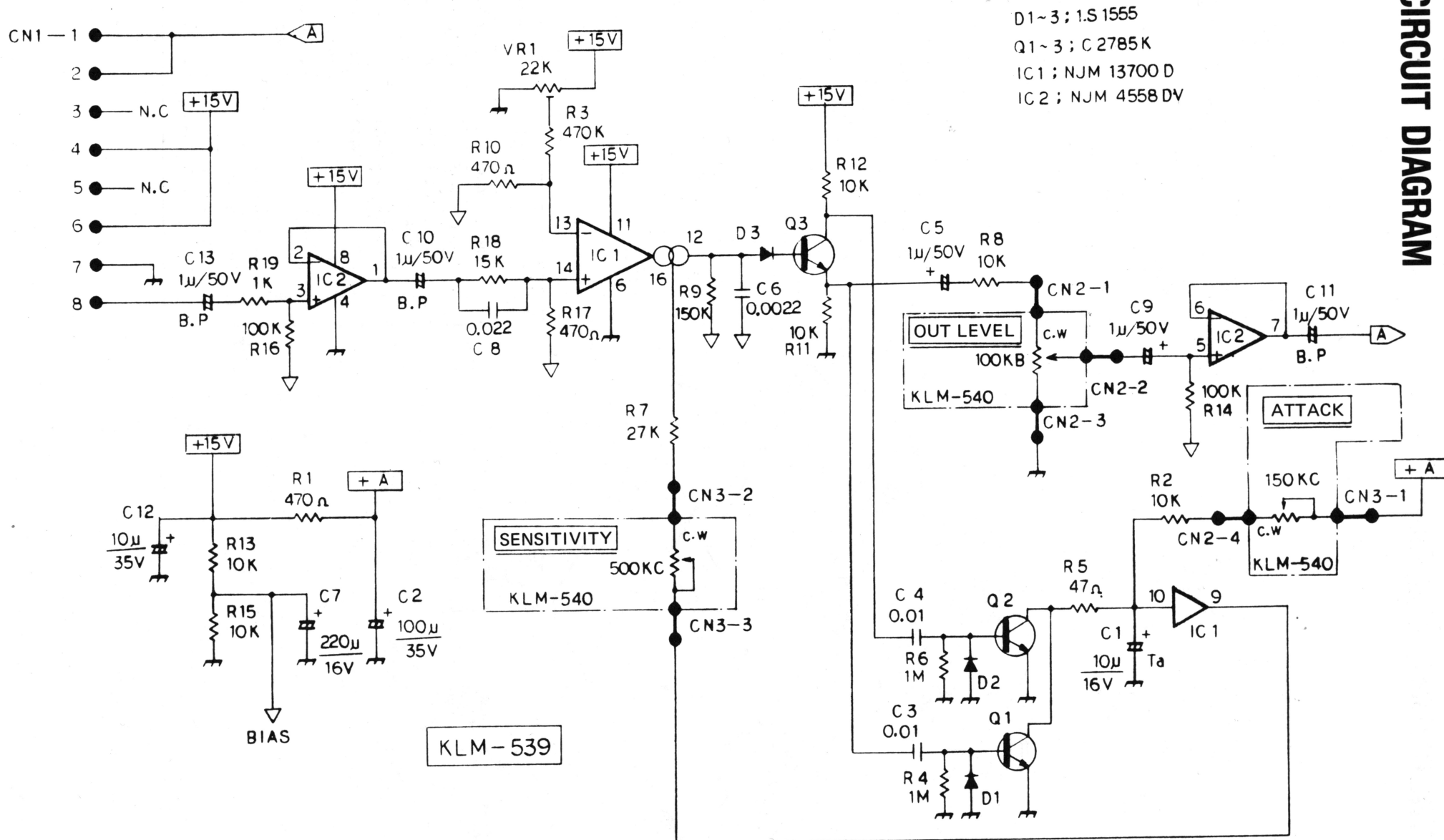
- **Nonclip Maximum Input Level:** +3 dBm/at 1 kHz.
- **Maximum Output Level:** -8 dBm/at 1 kHz.
- **Maximum Compression Ratio:** 39 dB/at 1 kHz, SENSITIVITY 10.
- **Operation Characteristics:** INPUT -40 dBm +3 dBm, OUTPUT -12 dBm -8 dBm at 1 kHz, SENSITIVITY 10.
- **Attack Time:** 5 msec.
- **Release Time:** 1 sec ~ 100 msec/ATTACK 0 ~ 10.
- **Noise Level:** -102 dBm equivalent input noise/IHF-A.
- **Power Consumption:** 7.5 mA.
- **Functions:** SENSITIVITY, ATTACK, OUT LEVEL.
- **Power Supply:** DC 15 V (DC is supplied from the Pedal-board).
- **Dimensions:** 68.0(W) x 56.5(H) x 106.5(D) mm.
- **Weight:** 190 g. (All values are typical).

2. STRUCTURAL DIAGRAM

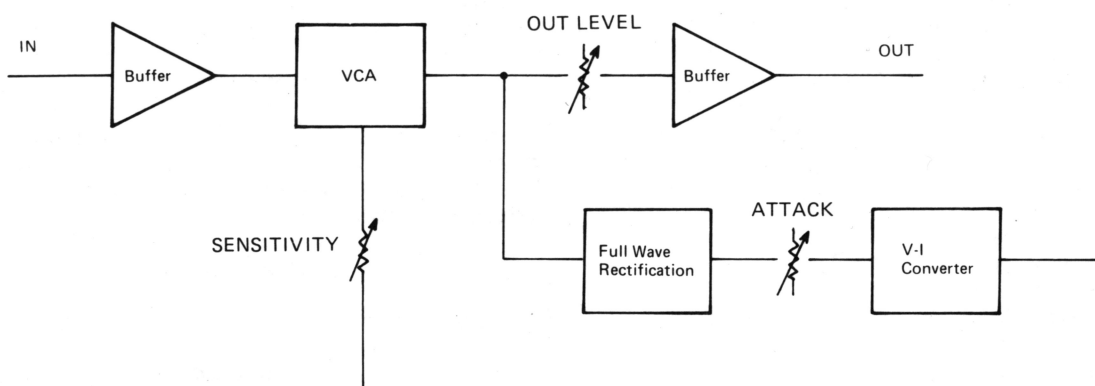


PART No.	PART NAME	REMARKS
1.	UPPER CASE	KOC-E20058
2.	LOWER CASE	KOC-E20062
3.	SHIELDING COVER	KOC-C40485
4.	SPRING	KOC-C40484
5.	ROTARY VR KNOB	KOC-E40138
6.	SPECIAL SCREW BN M4	KOC-C40488
7.	NUT	VM ZMC 7
8.	WASHER	WM ZMC 7
9.	SCREWS	PLAX B BZMC 3x10
10.	ROTARY VR	
11.	ROTARY VR	
12.	ROTARY VR	
13.	SERIAL NUMBER SEAL	KOC-F40050

3. CIRCUIT DIAGRAM



4. BLOCK DIAGRAM



5. ADJUSTMENT PROCEDURE

I. Before adjustment:

- Set knobs to these positions.

SENSITIVITY	10
ATTACK	10
OUT LEVEL	any position.

- Test equipment: Oscilloscope.

II. Adjustment.

NJM13700D offset adjustment (VR1).

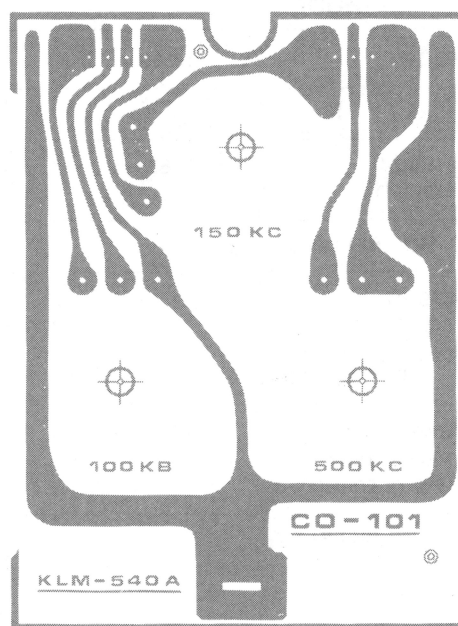
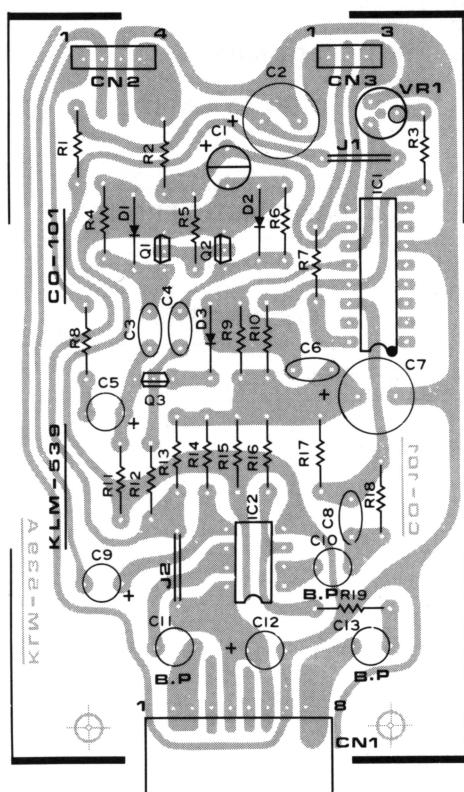
a. Ground input terminal.

- * Ground CN1-8 and CN1-7. Connect CN1-4 to $\pm 15V$.

b. Adjust VR1 to obtain 0V for IC1 12 pin $\sim 1/2V_{cc}$ (BIAS) voltage.

- * Ignore AC component if power supply hum is present at test point.

6. PC BOARD



7. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS			
10413247	S1/4JYTP 47Ω	KLM-539	1
10413347	S1/4JYTP 470Ω		3
10413410	S1/4JYTP 1K		1
10413510	S1/4JYTP 10K		6
10413515	S1/4JYTP 15K		1
10413527	S1/4JYTP 27K		1
10413610	S1/4JYTP 100K		2
10413615	S1/4JYTP 150K		1
10413647	S1/4JYTP 470K		1
10413710	S1/4JYTP 1M		2
MYLAR CAPACITORS			
20402422	50V 0.002μF K	KLM-539	1
20402510	50V 0.01μF K		2
20402522	50V 0.022μF K		1
TANTALUM CAPACITOR			
22407210	16V 10μF TPD1C100M8S-KXO	KLM-539	1
ELECTROLYTIC CAPACITORS			
25403322	16V 220μF RE-T2	KLM-539	1
25405210	35V 10μF RE-T2		1
25405310	35V 100μF RE-T2		1
25406110	50V 1μF RE-T2		2
25466110	50V 1μF RBP-T2		3
TRANSISTOR			
30420020	2SC2785 K TN	KLM-539	3
DIODE			
31400100	1S1555 TP	KLM539	3
IC			
32009001	NJM-4558D-V	KLM-539	1
32009026	NJM-13700-D		1
P.C. BOARD (without parts)			
34053901	KLM-539 TP		1
34054001	KLM-540		1
ROTARY VR			
36015900	K161100P7E-100KB	KLM-540	1
36016100	K161100P7E-150KC		1
36016200	K161100P7E-500KC		1
8 PIN PLUG			
47408100	XI-2343#01	KLM-539	1
SEMI-FIXED RESISTORS			
35001322	H0651A22KB	KLM-539	1

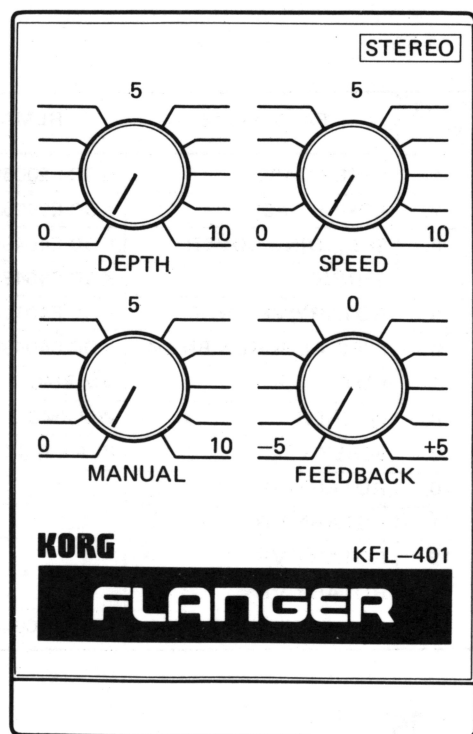
PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CONNECTOR			
47408300	WD-2103#01	KLM-540	1
47408301	WD-2104#01		1
47408500	SB3P-HVQ-55W JST	KLM-539	1
47408600	SB4P-HVQ-55W JST		1
ROTARY VR KNOB			
62012000	KOC-E40138	KLM-539	3
SPRING			
64062000	KOC-C40484		1
SHIELDING COVER			
64062200	KOC-C40485	KLM-540	1
UPPER CASE			
64613800	KOC-E20058		1
LOWER CASE			
64614600	KOC-E20062		1
SERIAL NUMBER SEAL			
68599999			1
SCREWS, NUTS, WASHERS (PLEASE REFER TO STRUCTURAL DIAGRAM)			
74560310	PLAX B BZMC 3x10		2
77330701	VN ZMC 7		3
78030700	WM ZMC 7		3
79120000	BN M4 KOC-C40488		1
DISPLAY CARD			
80008200			1
CLEAR PLASTIC FRONT			
80008201			1
PACKING PAD			
80008230	KOC-I40061		1

FLANGER

KFL-401

CONTENTS

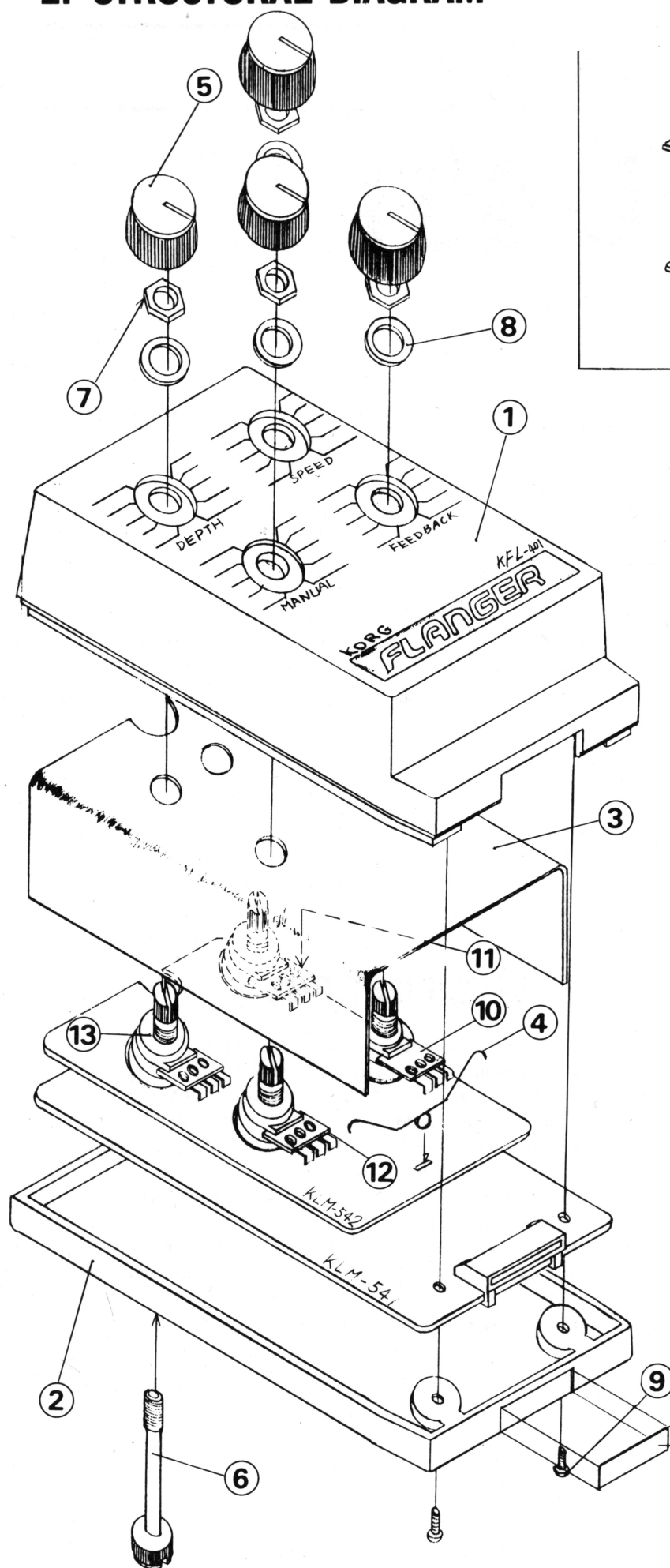
1. SPECIFICATIONS	25
2. STRUCTURAL DIAGRAM	26
3. BLOCK DIAGRAM	27
4. ADJUSTMENT PROCEDURE	27
5. PC BOARD	27
6. CIRCUIT DIAGRAM	28
7. PARTS LIST	29



1. SPECIFICATIONS

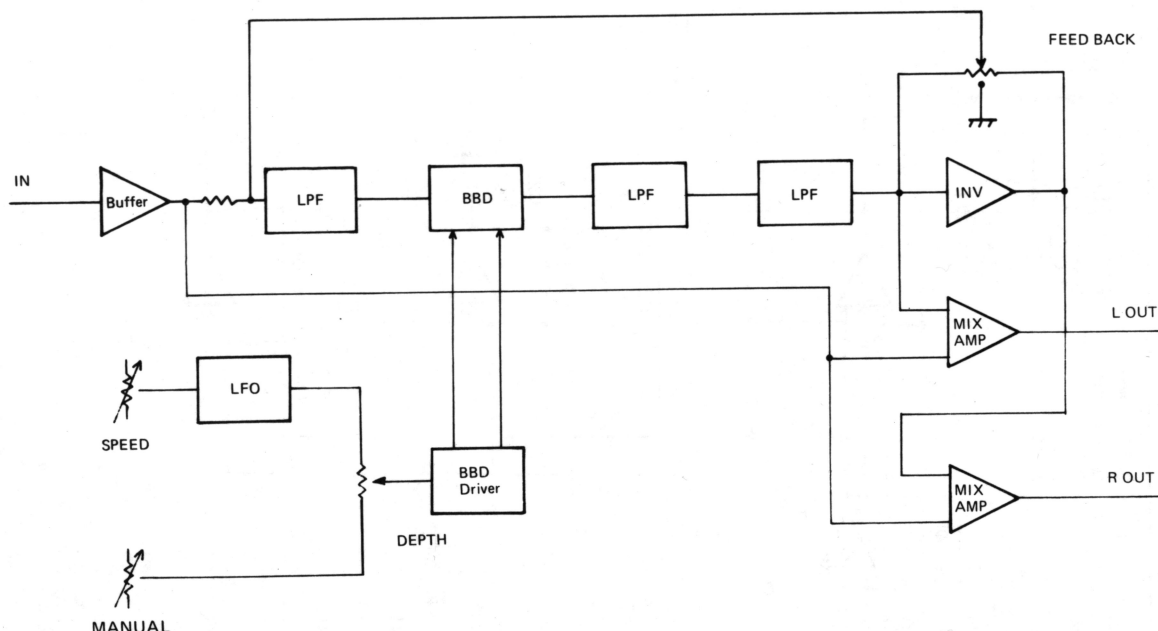
- **Maximum Input Level:** +6 dBm/at 1 kHz.
- **Maximum Output Level:** +6 dBm/at 1 kHz.
- **Delay Time:** 1 msec ~ 12 msec/MANUAL 10 ~ 0.
- **Modulation Speed:** 0.03 Hz ~ 11 Hz/Speed 0 ~ 10.
- **Feedback:** -100% ~ +100%/MANUAL 0, DEPTH 0, FEEDBACK -5 ~ 0 ~ +5.
- **Noise Level:** -100 dBm equivalent input noise/IHF-A.
- **Power Consumption:** 35 mA.
- **Functions:** SPEED, DEPTH, MANUAL FEEDBACK.
- **Power Supply:** DC 15 V (DC is supplied from the Pedal-board).
- **Dimensions:** 68.0(W) x 56.5(H) x 106.5(D) mm.
- **Weight:** 220 g. (All values are typical).

2. STRUCTURAL DIAGRAM



PART No.	PART NAME	REMARK
1.	UPPER CASE	KOC-E20058
2.	LOWER CASE	KOC-E20062
3.	SHIELDING COVER	KOC-C40485
4.	SPRING	KOC-C40484
5.	ROTARY VR KNOB	KOC-E40138
6.	SPECIAL SCREW BN M4	KOC-C40488
7.	NUT	VM ZMC 7
8.	WASHER	WM ZMC 7
9.	SCREWS	PLAX B BZMC 3x10
10.	ROTARY VR	
11.	ROTARY VR	
12.	ROTARY VR	
13.	ROTARY VR	
14.	SERIAL NUMBER SEAL	KOC-F40050

3. BLOCK DIAGRAM



4. ADJUSTMENT PROCEDURE

I. Before adjustment.

- Set knobs to these positions:

MANUAL	0
SPEED	0
DEPTH	0
FEEDBACK	0 (Center)

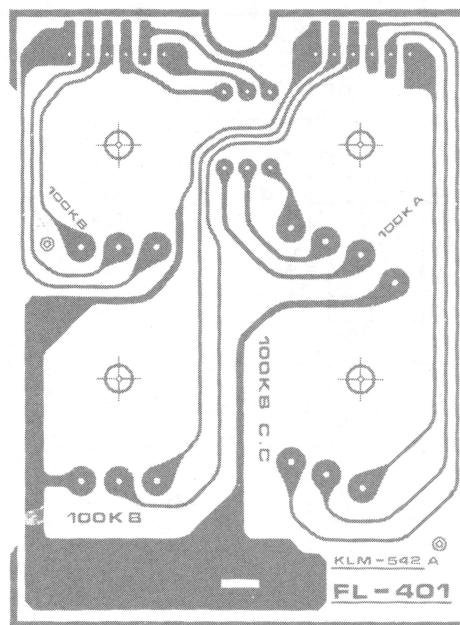
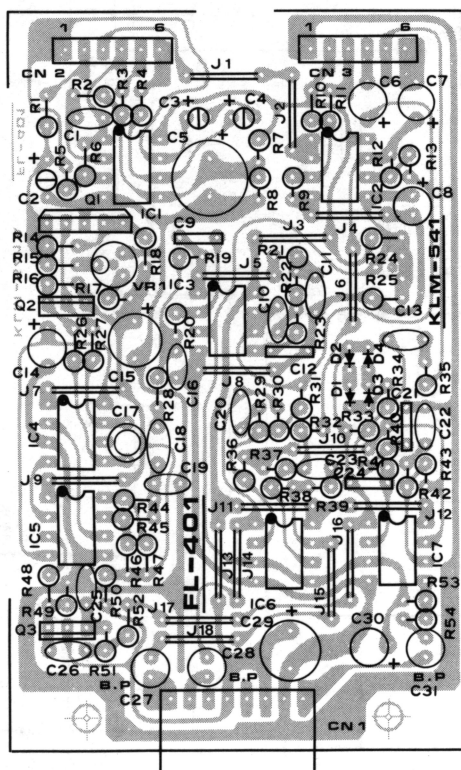
- Test equipment: Frequency counter.

II. Adjustment.

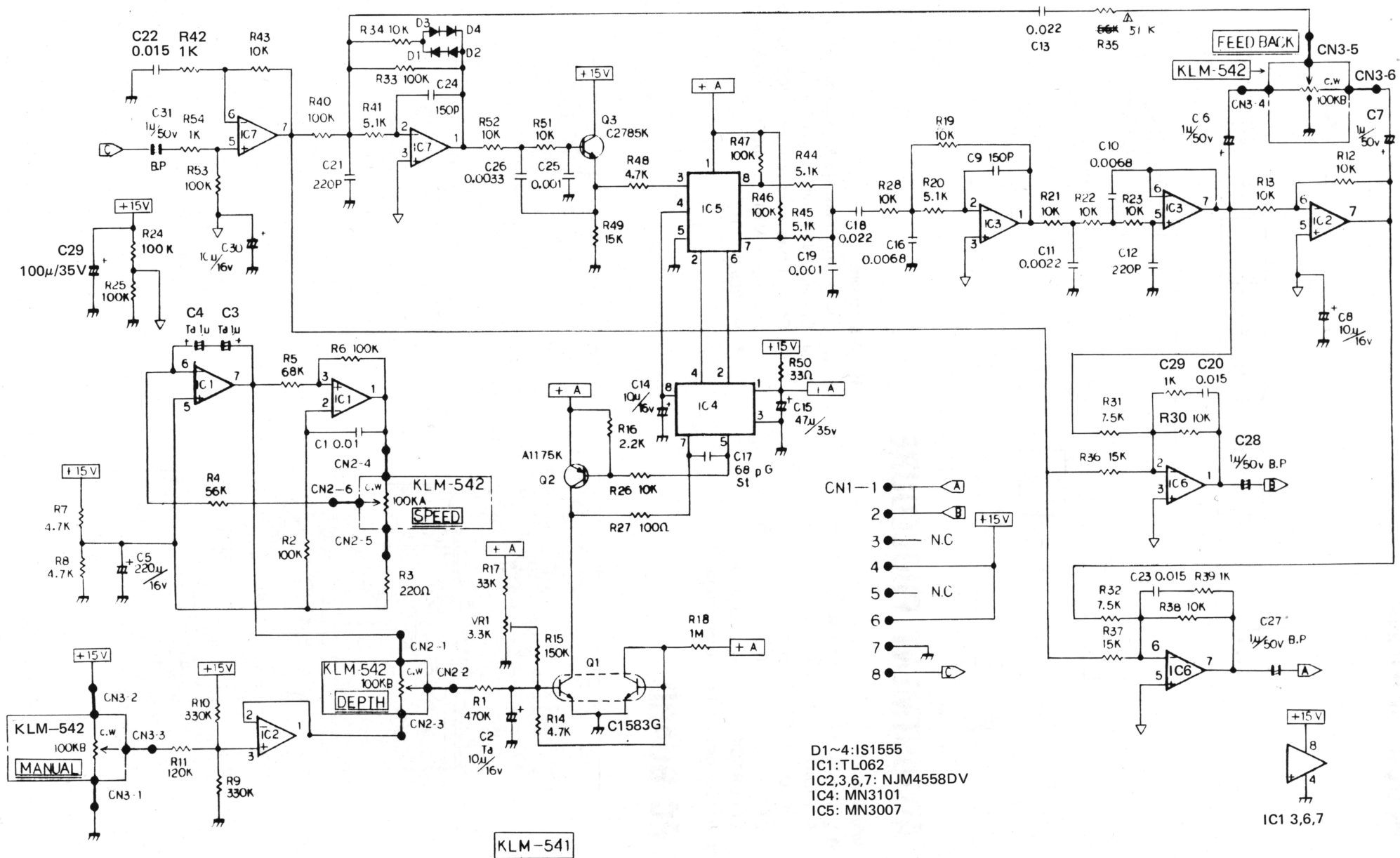
Adjustment of lowest clock frequency (VR1)

- Ground CN1-7 and connect CN1-4 to +15V.
- Connect frequency counter to IC5 (MN3007) 2 pin and adjust VR1 to obtain a clock frequency of Hz (25 μ S) $\pm$ 10%.

5. PC BOARD



6. CIRCUIT DIAGRAM



7. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS			
10113233	S1/4JT 33Ω	KLM-541	1
10113310	S1/4JT 100Ω		1
10113322	S1/4JT 220Ω		1
10113410	S1/4JT 1K		4
10113422	S1/4JT 2.2K		1
10113447	S1/4JT 4.7K		4
10113451	S1/4JT 5.1K		4
10113475	S1/4JT 7.5K		2
10113510	S1/4JT 10K		14
10113515	S1/4JT 15K		3
10113533	S1/4JT 33K		1
10113551	S1/4JT 51K		1
10113556	S1/4JT 56K		1
10113568	S1/4JT 68K		1
10113610	S1/4JT 100K		9
10113612	S1/4JT 120K		1
10113615	S1/4JT 150K		1
10113633	S1/4JT 330K		2
10113647	S1/4JT 470K		1
10113710	S1/4JT 1M		1
10509000	YLC 0Ω	KLM-542	3
MYLAR CAPACITORS			
20023410	50V 0.001μF K	KLM-541	1
20023468	50V 0.068μF K		2
20023510	50V 0.01μF K		1
20023515	50V 0.015μF K		2
20402410	50V 0.001μF K		1
20402422	50V 0.0022μF K		1
20402433	50V 0.0033μF K		1
20402515	50V 0.015μF K		1
20402522	50V 0.022μF K		2
STYROL CAPACITOR			
20502268	50V GT 68PF	KLM-541	1
CERAMIC CAPACITORS			
21256322	50V 220PFJ HE70SJSL221J	KLM-541	1
21257315	50V 150PF HE60SJSL151K		1
21443151	50V 150PF RTHE60TKSL151K		1
21443220	50V 220PF RTHE70TKSL221J		1
TANTALUM CAPACITORS			
22007210	16V 10μF K CS15E1C100K	KLM-541	1
22015110	50V 1μF CS15E1H010K1S		2

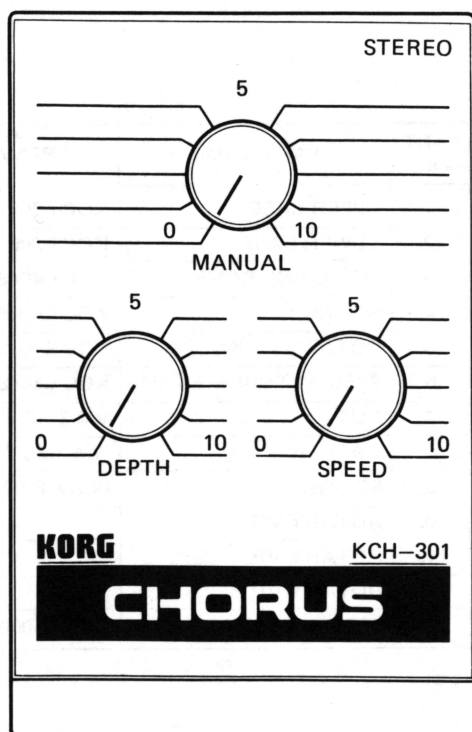
PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
ELECTROLYTIC CAPACITORS			
23507210	16V 10μF RE	KLM-541	1
24515110	A50V 1μF RBP		3
25403210	16V 10μF RE•T2		2
25403322	16V 220μF RE•T2		1
25405247	35V 47μF RE•T2		1
25405310	35V 100μF RE•T2		1
25406110	50V 1μF RE•T2		2
TRANSISTORS			
30001311	2SA1175 K	KLM-541	1
30201107	2SC1583 G		1
30202211	2SC2785 K		1
DIODES			
31000100	1S1555	KLM-541	4
IC			
32002011	MN-3007	KLM-541	1
32002014	MN-3101		1
32009001	NJM-4558D-V		4
32021022	TL-062		1
P.C. BOARD (without parts)			
34054101	KLM-541 TP		1
24054201	KLM-542		1
SEMI-FIXED RESISTORS			
35001233	H0651A 3.3K	KLM-541	1
ROTARY VR			
36015900	K161100P7E-100KB	KLM-542	2
36016300	K161100P7E-100KA		1
36016400	K16110AJ5E-100KB		1
8 PIN PLUG			
47408100	XI-2343#01	KLM-541	1
CONNECTORS			
47408302	WD-2106#01	KLM-542	2
47408700	SB6P-HVQ-55W JST		2
ROTARY KNOB			
62012000	KOC-E40138	KLM-542	4
SPRING			
64062000	KOC-C40484	KLM542	1
SHEILDING COVER			
64062200	KOC-C40485	KLM-542	1

CHORUS

KCH-301

CONTENTS

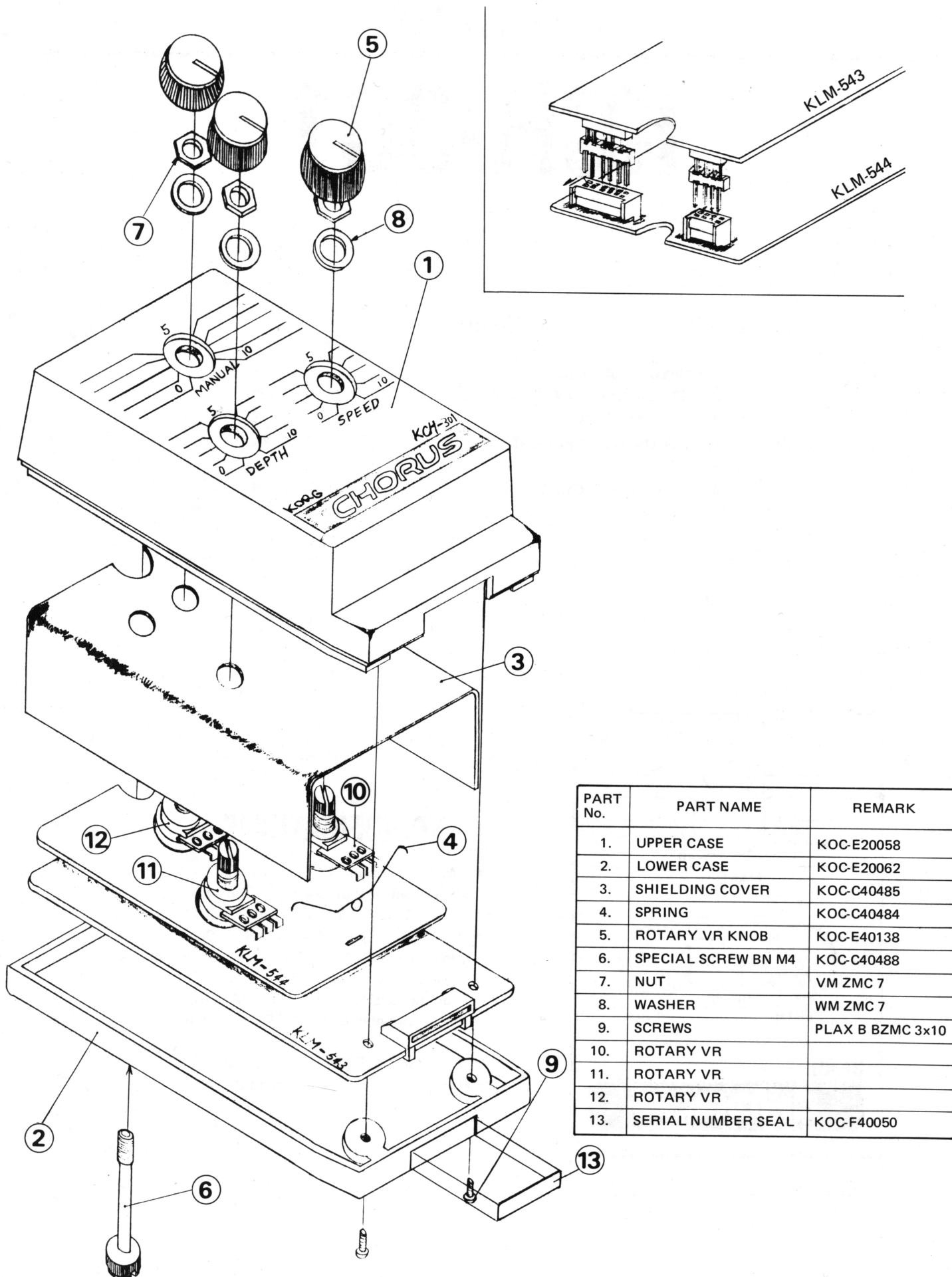
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4. ADJUSTMENT PROCEDURE	33
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6. CIRCUIT DIAGRAM	34
7. PARTS LIST	35



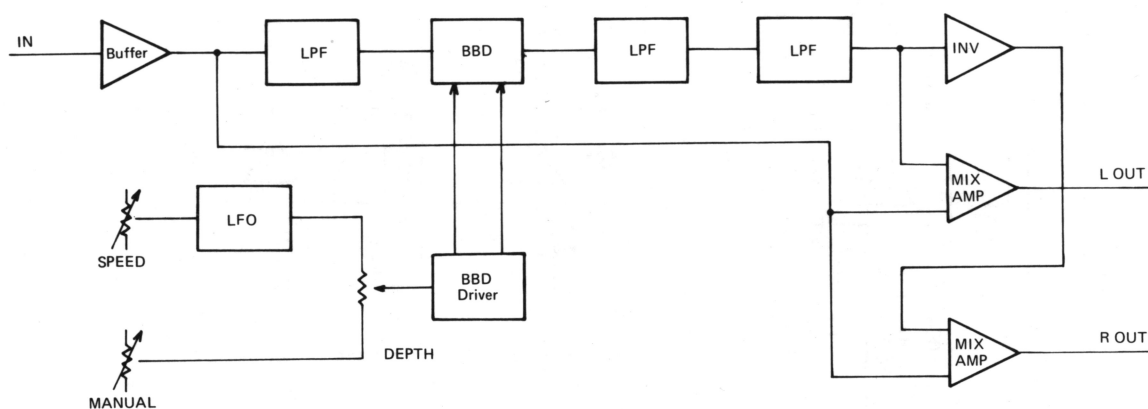
1. SPECIFICATIONS

- Maximum Input Level: +6 dBm/at 1 kHz.
- Maximum Output Level: +6 dBm/at 1 kHz.
- Delay Time: 1.5 msec ~ 5 msec/ MANUAL 10 ~ 0.
- Modulation Speed: 0.2 Hz ~ 8 Hz/Speed 0 ~ 10.
- Noise Level: -100 dBm equivalent input noise/IHF-A.
- Power Consumption: 24 mA.
- Functions: SPEED, DEPTH, MANUAL.
- Power Supply: DC 15 V (DC is supplied from the Pedal-board).
- Dimensions: 68.0(W) x 56.5(H) x 106.5(D) mm.
- Weight: 210 g. (All values are typical).

2. STRUCTURAL DIAGRAM



3. BLOCK DIAGRAM



4. ADJUSTMENT PROCEDURE

I. Before adjustment.

- Set knob to these positions:

MANUAL	0
SPEED	0
DEPTH	0

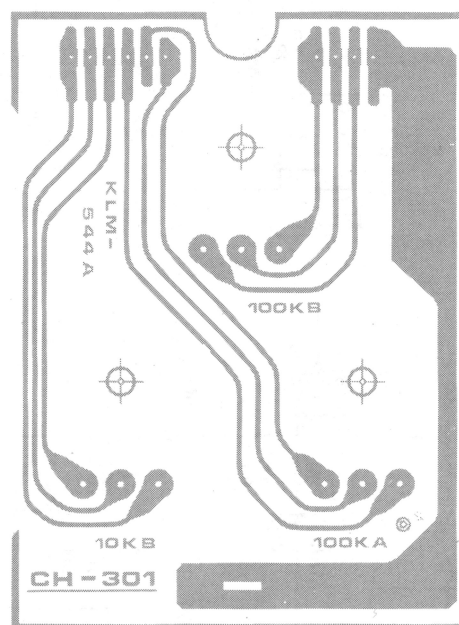
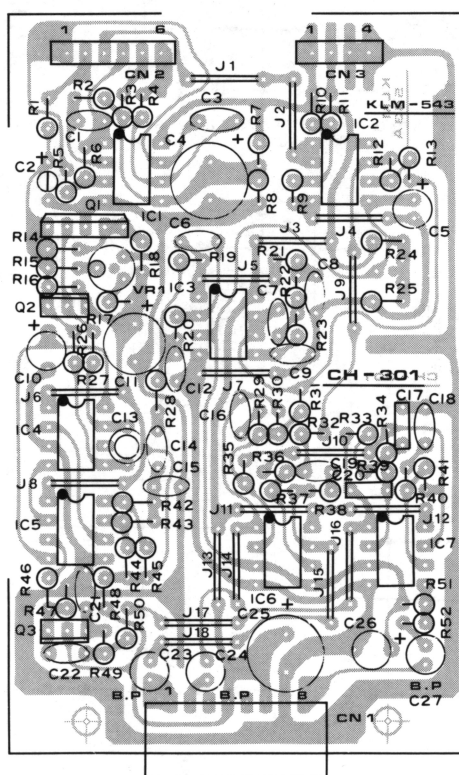
- Test equipment: Frequency counter.

II. Adjustment.

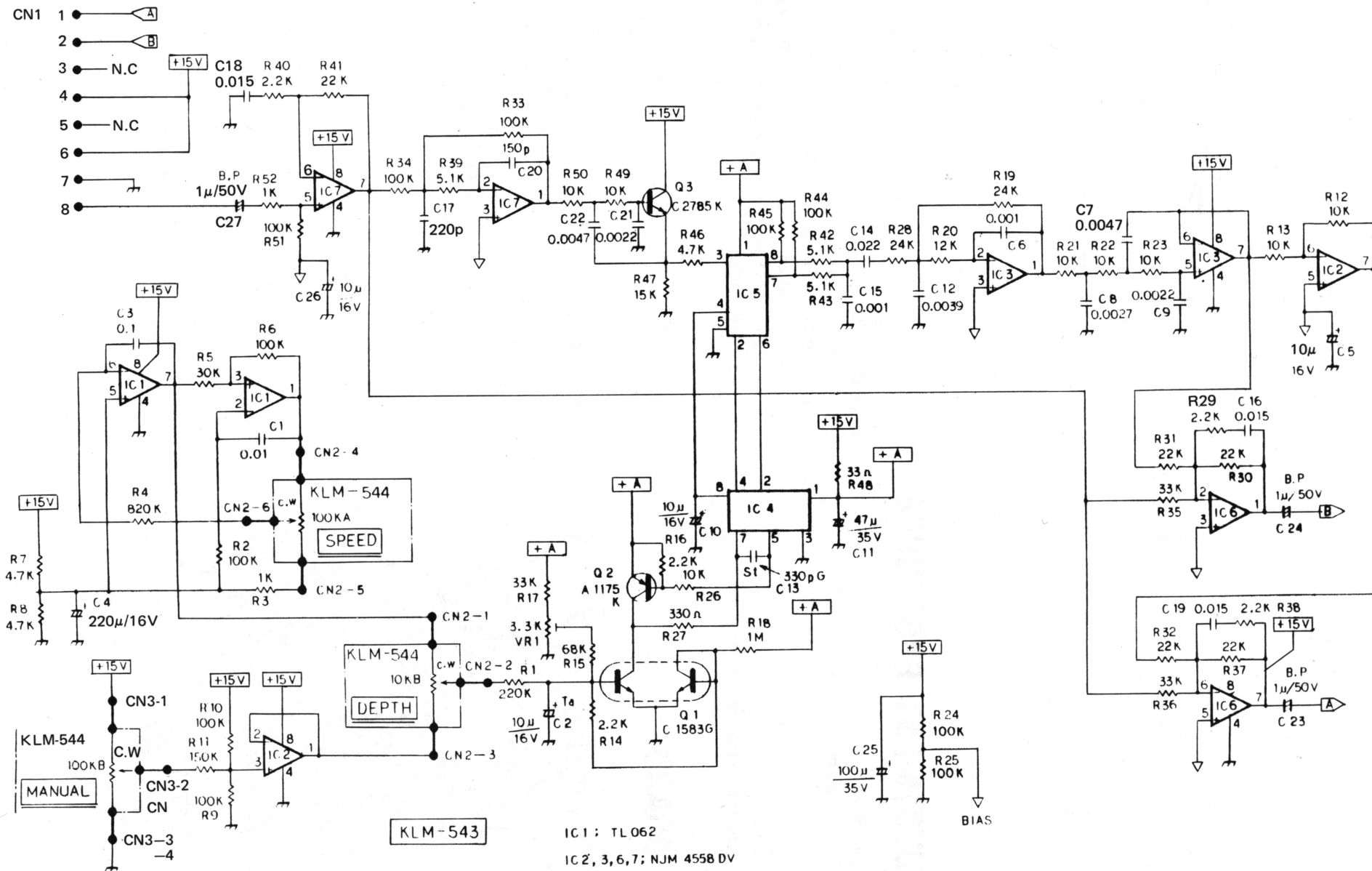
Adjustment of lowest clock frequency (VR1)

- Ground CN1-7 and connect CD1-4 to +15V.
- Connect frequency counter to IC5 (MN3009) 2 pin and adjust VR1 to obtain a clock frequency of 25k Hz ($40\mu\text{S}$) $\pm 10\%$.

5. PC BOARD



6. CIRCUIT DIAGRAM



IC 1 : TL062
 IC 2, 3, 6, 7; NJM 4558 DV
 IC 4 : MN 3101
 IC 5 : MN 3009

7. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS			
10113233	S1/4JT 33Ω	KLM-543	1
10113333	S1/4JT 330Ω		1
10113410	S1/4JT 1K		2
10113422	S1/4JT 2.2K		5
10113447	S1/4JT 4.7K		3
10113451	S1/4JT 5.1K		3
10113510	S1/4JT 10K		8
10113512	S1/4JT 12K		1
10113515	S1/4JT 15K		1
10113522	S1/4JT 22K		5
10113524	S1/4JT 24K		2
10113530	S1/4JT 30K		1
10113533	S1/4JT 33K		3
10113568	S1/4JT 68K		1
10113610	S1/4JT 100K		11
10113615	S1/4JT 150K		1
10113622	S1/4JT 220K	1	
10113682	S1/4JT 820K	1	
10113710	S1/4JT 1M	1	
MYLAR CAPACITORS			
20023410	50V 0.001μF K	KLM-543	1
20023439	50V 0.0039μF K		1
20023447	50V 0.0047μF K		1
20023510	50V 0.01μF K		1
20023515	50V 0.015μF K		2
20402410	50V 0.001μF K		1
20402422	50V 0.0022μF K		2
20402427	50V 0.0027μF K		1
20402447	50V 0.0047μF K		1
20402515	50V 0.015μF K		1
20402522	50V 0.022μF K		1
20402610	50V 0.1μF K		1
STYROL CAPACITOR			
20502333	50V GT 330PF	KLM-543	1
CERAMIC CAPACITORS			
21256322	50V 220PFJ	KLM-543	1
21257315	50V 150PF		1
TANTALUM CAPACITOR			
22007210	16V 10μF K	KLM-543	1
ELECTROLYTIC CAPACITORS			
23507210	16V 10μF RE	KLM-543	1
24515110	A50V 1μF RBP		3
25403210	16V 10μF RE•T2		2
25403322	16V 220μF RE•T2		1
25405247	35V 47μF RE•T2		1
25405310	35V 100μF RE•T2		1
TRANSISTORS			
30001311	2SA1175 K	KLM-543	1
30201107	2SC1583 G		1
30202211	2SC2785 K		1

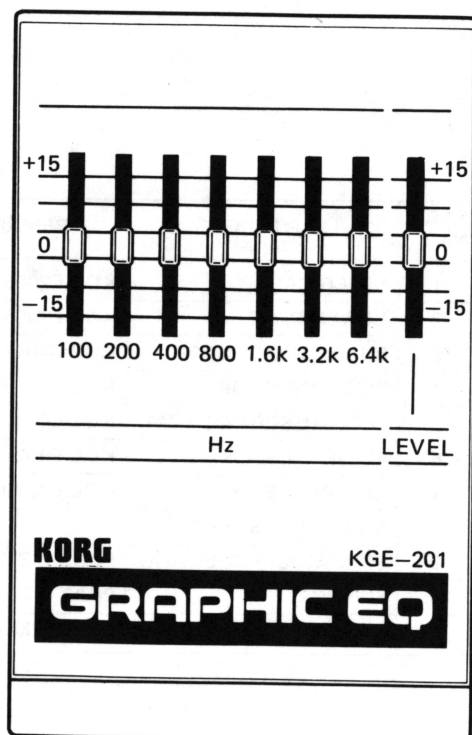
PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
IC			
32002013	MN-3009	KLM-543	1
32002014	MN-3101		1
32009001	NJM-4558D-V		4
32021022	TL-062		1
P.C. BOARD (without parts)			
34054301	KLM-543 TP		1
34054401	KLM-544		1
SEMI-FIXED RESISTOR			
35001233	H0651A 3.3K	KLM-543	1
ROTARY VR			
36015900	K161100P7E-100KB	KLM-544	1
36016300	K161100P7E-100KA		1
36016500	K161100P7E-10KB		1
8 PIN PLUG			
47408100	XI-2343 #01	KLM-543	1
CONNECTOR			
47408301	WD-2104 #01	KLM-544	1
47408302	WD-2106 #01		1
47408600	SB4P-HVQ-55W JST	KLM-543	1
47408700	SB6P-HVQ-55W JST		1
ROTARY VR KNOB			
62012000	KOC-E40138	KLM-543	3
SPRING			
64062000	KOC-C40484	KLM-544	1
SHIELDING COVER			
64062200	KOC-C40485		1
UPPER CASE			
64612600	KOC-E20058		1
LOWER CASE			
64614600	KOC-E20062		1
SERIAL NUMBER SEAL			
68599999			1
SCREWS, NUTS, WASHERS, (PLEASE REFER TO STRUCTURAL DIAGRAM)			
74560310	PLAX B BZMC 3x10		2
77330701	VN ZMC 7		3
78030700	WM ZMC 7		3
79120000	BN M4 KOC-C40488		1

GRAPHIC EQ

KGE-201

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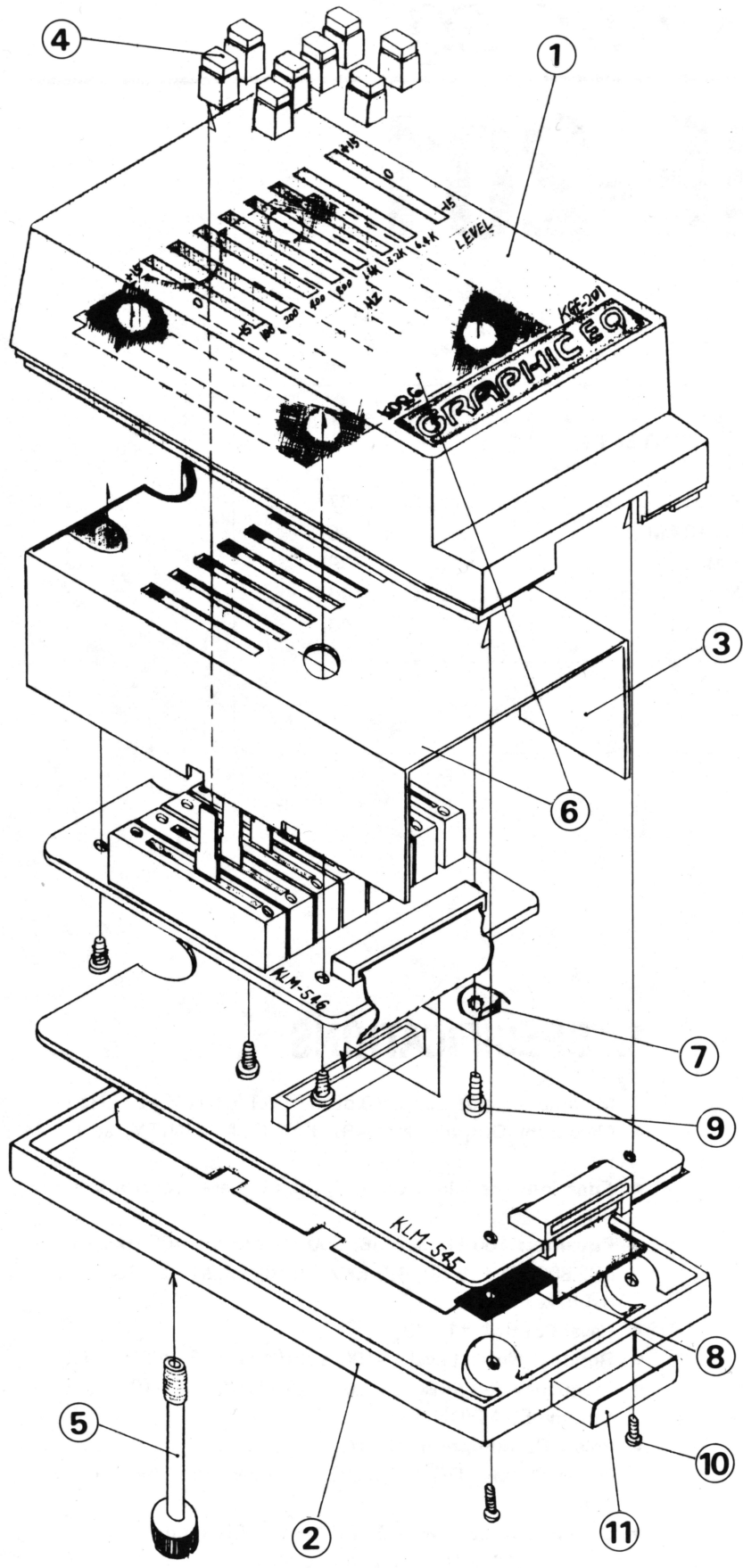
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2. STRUCTURAL DIAGRAM	38
3. CIRCUIT DIAGRAM	39
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5. PC BOARD	40
6. PARTS LIST	41



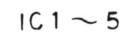
1. SPECIFICATIONS

- **Maximum Input Level:** +8 dBm FLAT/UNITY, at 1 kHz.
- **Maximum Output Level:** +8 dBm FLAT/UNITY, at 1 Hz.
- **Functions:** Equalizer Control Vol x 7, Level Control Vol x 1.
- **Equalizer:** 100 Hz ± 15 dB, 200 Hz ± 15 dB, 400 Hz ± 15 dB, 800 Hz ± 15 dB, 1.6 kHz ± 15 dB, 3.2 kHz ± 15 dB, 6.4 kHz ± 15 dB.
- **Level Control:** ± 15 dB.
- **Residual Noise Level:** -100 dBm/IHG-A, FLAT/UNIT.
- **Frequency Response:** 20 Hz ~ 20 kHz/Input -10 dBm. Volume FLAT/UNIT.
- **Power Consumption:** 19 mA.
- **Power Supply:** DC 15 V (DC is supplied from the Pedal-board).
- **Dimensions:** 68.0(W) x 55.0(H) x 106.5(D) mm.
- **Weight:** 190 g. (All values are typical).

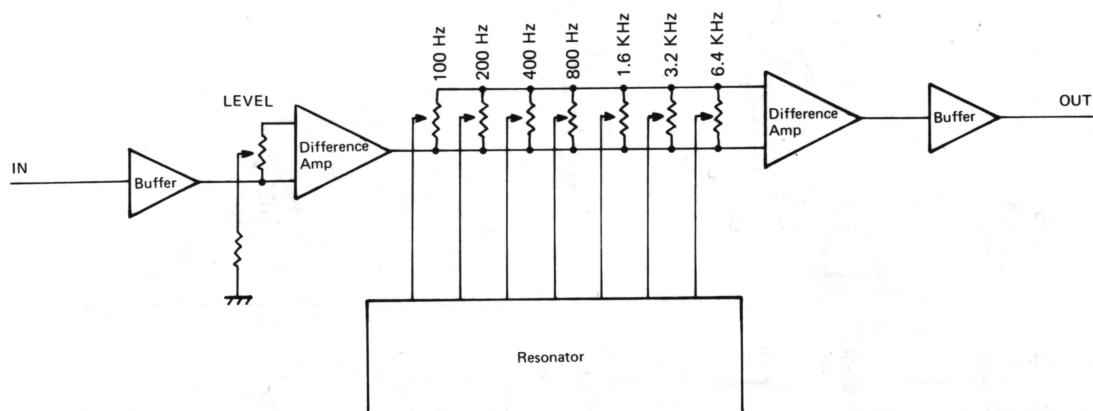
2. STRUCTURAL DIAGRAM



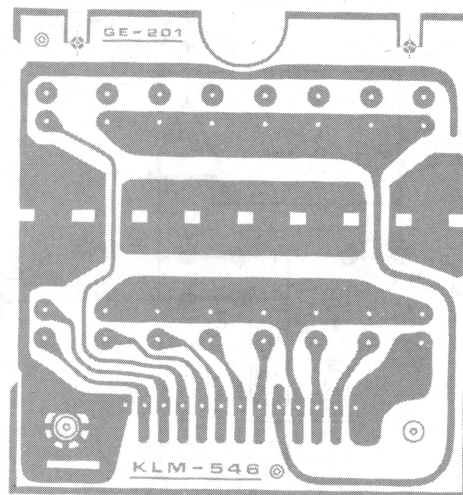
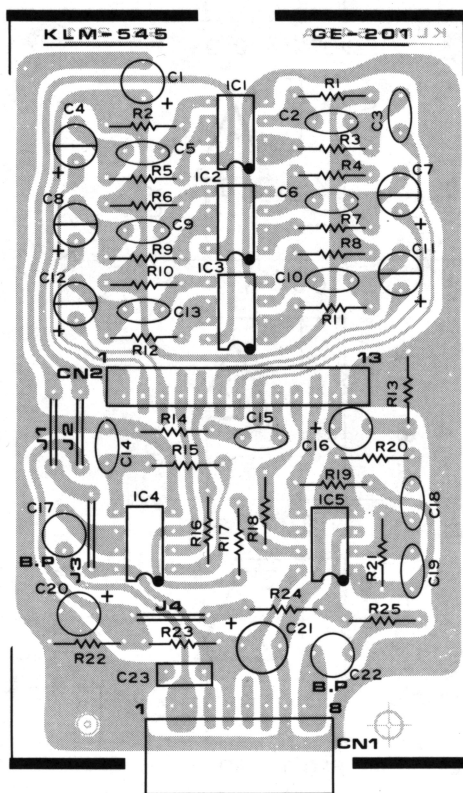
PART No.	PART NAME	REMARKS
1.	UPPER CASE	KOC-E20058
2.	LOWER CASE	KOC-E20062
3.	SHIELDING COVER	KOC-C40485
4.	SLIDE VR KNOB	KOC-E40139
5.	SPECIAL SCREW BN M4	KOC-C40488
6.	SLIDE VR MASK	KOC-F40261
7.	GND PLATE	KOC-C40498
8.	SHIELDING SHEET	
9.	SCREWS for P.C. BOARD	PLAX B ZMC 3x8
10.	SCREWS	PLAX B ZMC 3x10
11.	SERIAL NUMBER SEAL	KOC-F40050



4. BLOCK DIAGRAM



5. PC BOARD



6. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS			
10413322	S1/4JYTP 220Ω	KLM-545	1
10413347	S1/4JYTP 470Ω		7
10413410	S1/4JYTP 1K		2
10413447	S1/4JYTP 4.7K		4
10413468	S1/4JYTP 6.8K		2
10413510	S1/4JYTP 10K		2
10413610	S1/4JYTP 100K		3
10413611	S1/4JYTP 110K		3
10413613	S1/4JYTP 130K		1
MYLAR CAPACITORS			
20402410	50V 0.001μF K	KLM-545	2
20402422	50V 0.0022μF K		1
20402447	50V 0.0047μF K		1
20402510	50V 0.01μF K		1
20402515	50V 0.015μF K		3
20402539	50V 0.039μF K		1
20402547	50V 0.047μF K		2
21445100	50V 0.01μF		1
	RTHE70TKYF1032		
TANTALUM CAPACITOR			
22423115	20V 1.5μF TPD1D1R5M8S-KXO	KLM-545	1
22425010	35V 0.1μF TPD1VR1M8S-KXO		1
22425015	35V 0.15μF TPD1VR15M8S-KXO		1
22425033	35V 0.33μF TPD1VR33M8S-KXO		
22425068	35V 0.68μF TPD1VR68M8S-KXO		1
			1
ELECTROLYTIC CAPACITORS			
25403120	16V 10μF RE•T2	KLM-545	2
25403247	16V 47μF RE•T2		1
25405310	35V 100μF RE•T2		1
25466110	50V 1μF RBP•T2		2
IC			
32009001	NJM-4558D-V	KLM-545	5
P.C. BOARD (without parts)			
34054501	KLM-545 TP		1
34054600	KLM-546		1
SLIDE VR			
36503900	EVA-H41CAAB14	KLM-545	8
CONNECTOR			
47141300	HBLB-13S-1J	KLM-545	1
47241300	HBLB-13R-1J	KLM-546	1
8 PIN PLUG			
47408100	XI-2343#01	KLM-545	1

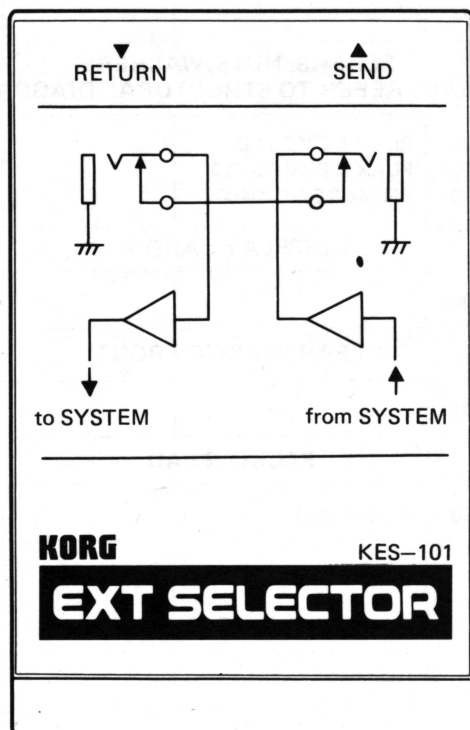
PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
FLAT CABLE			
54520080	SMCD-13X75-ADX10		1
SLIDE VR MASK			
55006200	KOC-F40261		1
SHIELDING SHEET			
58018002	KOC-E40267		1
SLIDE VR KNOB			
62012100	KOC-E40139		8
GND PLATE			
64062100	KOC-C40498		1
SHIELDING COVER			
6406230	KOC-C40486		1
UPPER CASE C			
64613200	KOC-E20059		1
LOWER CASE			
64614600	KOC-E20062		1
SERIAL NUMBER SEAL			
68599999			1
SCREWS, NUTS, WACHERS (PLEASE REFER TO STRUCTURAL DIAGRAM)			
74530308	PLAX B ZMC 3X8		4
74560310	PLAX B BZMC 3X10		2
79120000	BN M4 KOC-C40488		1
DISPLAY CARD			
80008200			1
CLEAR PLASTIC FRONT			
80008201			1
PACKING PAD			
80008230	KOC-I40061		1

EXT SELECTOR

KES-101

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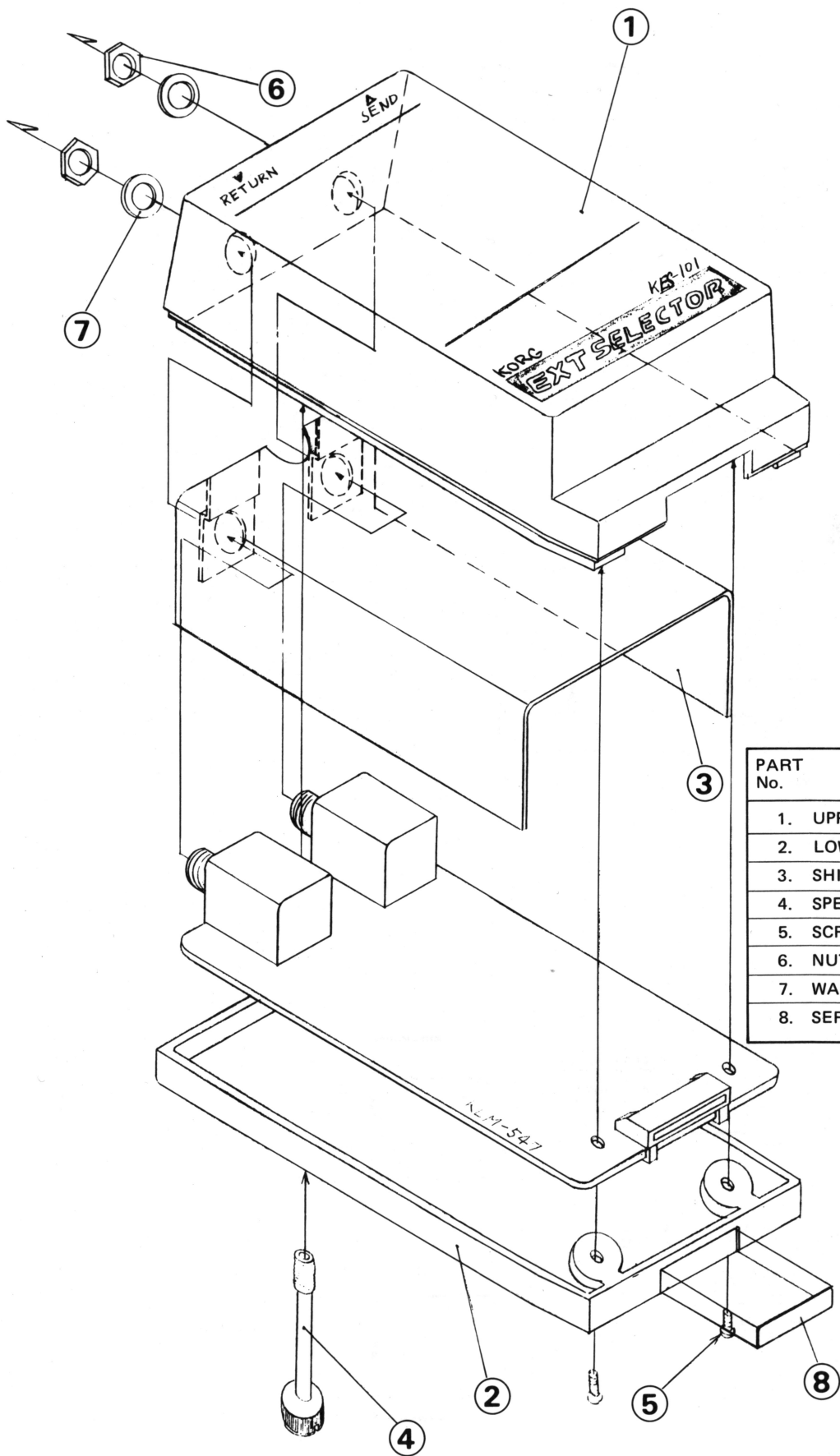
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5. PC BOARD	44
6. PARTS LIST	45



1. SPECIFICATIONS

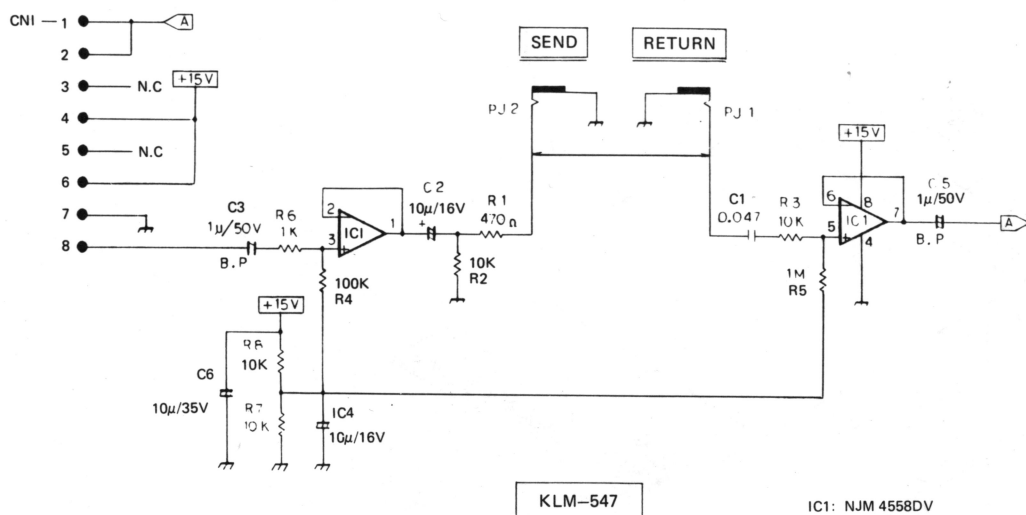
- Return Input Impedance: 1 M Ω .
- Send Output Impedance: 1 k Ω .
- Maximum Input Level: +8 dBm.
- Maximum Output Level: +8 dBm.
- Residual Noise Level: -104 dBm/IHF-A.
- Frequency Response: 20 Hz ~ 20 kHz, -3 dB +0.
- Power Consumption: 5 mA.
- Functions: SEND, RETURN.
- Power Supply: DC 15 V (DC is supplied from the Pedal-board).
- Dimensions: 68.0(W) x 45.0(H) x 109.5(D) mm.
- Weight: 140 g. (All values are typical).

2. STRUCTURAL DIAGRAM

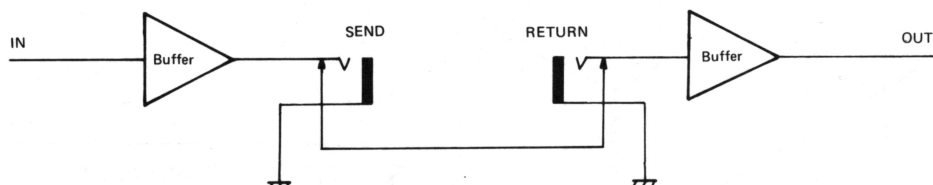


PART No.	PART NAME	REMARK
1.	UPPER CASE	KOC-E20061
2.	LOWER CASE	KOC-E20062
3.	SHIELDING COVER	KOC-C40487
4.	SPECIAL SCREW	BN M4
5.	SCREWS	PLAX B BZMC 3x10
6.	NUTS	VN N-3 9
7.	WASHER	N-3 9x14x0.5
8.	SERIAL NUMBER SEAL	

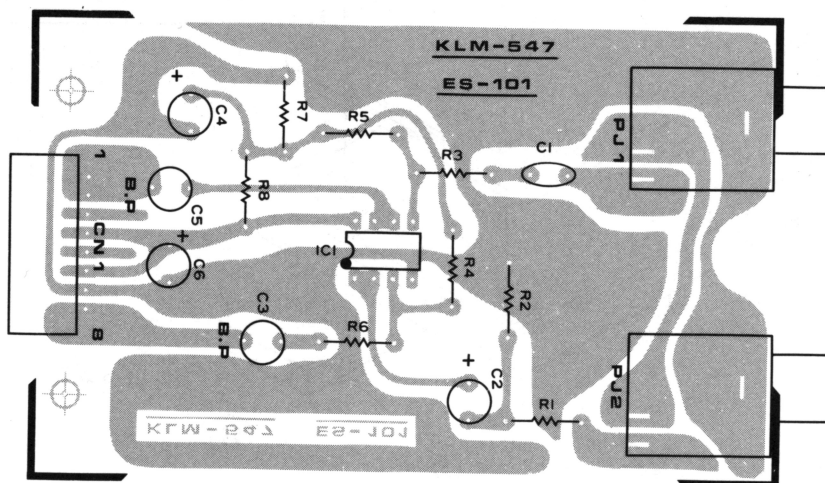
3. CIRCUIT DIAGRAM



4. BLOCK DIAGRAM



5. PC BOARD



6. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS			
10413347	S1/4JYTP 470Ω	KLM-547	1
10413410	S1/4JYTP 1K		1
10413510	S1/4JYTP 10K		4
10413610	S1/4JYTP 100K		1
10413710	S1/4JYTP 1M		1
MYLAR CAPACITOR			
20402547	50V 0.047μF K	KLM-547	1
ELECTROLYTIC CAPACITORS			
25403210	16V 10μF RE•T2	KLM-547	2
25405210	35V 10μF RE•T2		1
25466110	50V 1μF RBP•T2		2
IC			
32009001	NJM-4558D-V	KLM-547	1
P.C. BOARD (without parts)			
34054700	KLM-547 TP		1
PHONE JACK			
45000600	S-G 7622 #06	KLM-547	2
8 PIN PLUG			
47408100	XI-2343#01	KLM-547	1
SHIELDING COVER			
64062400	KOC-C40487		1
UPPER CASE			
64613600	KOC-E20061		1
LOWER CASE			
64614600	KOC-E20062		1
SERIAL NUMBER SEAL			
68599999			1
SCREWS, NUTS, WASHERS (PLEASE REFER TO STRUCTURAL DIAGRAM)			
74560310	PLAX B BZMC 3x10		2
77310900	VN N-3 9		2
79040914	N-3 9x14x0.5		2
79120000	BN M4 KOC-C40488		1

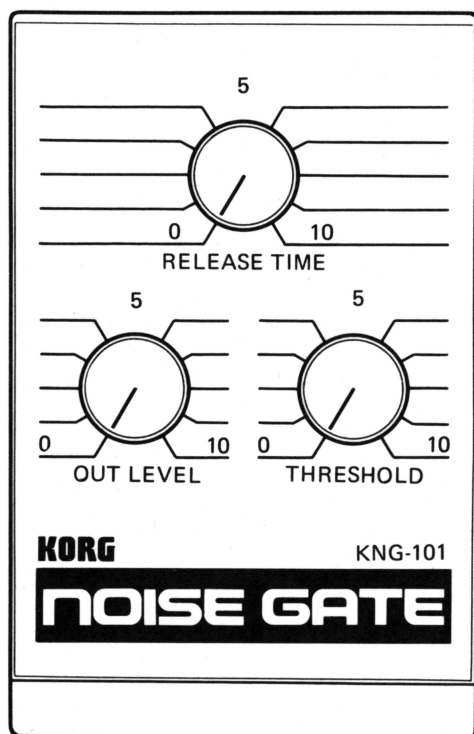
[illegible]

NOISE GATE

KNG-101

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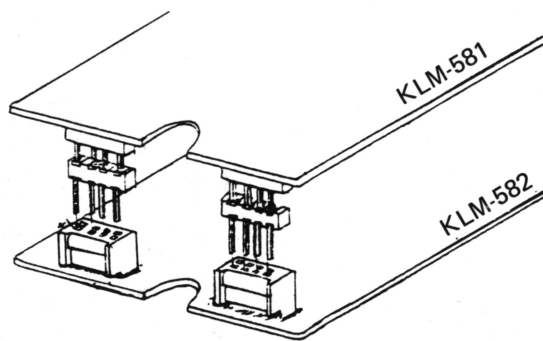
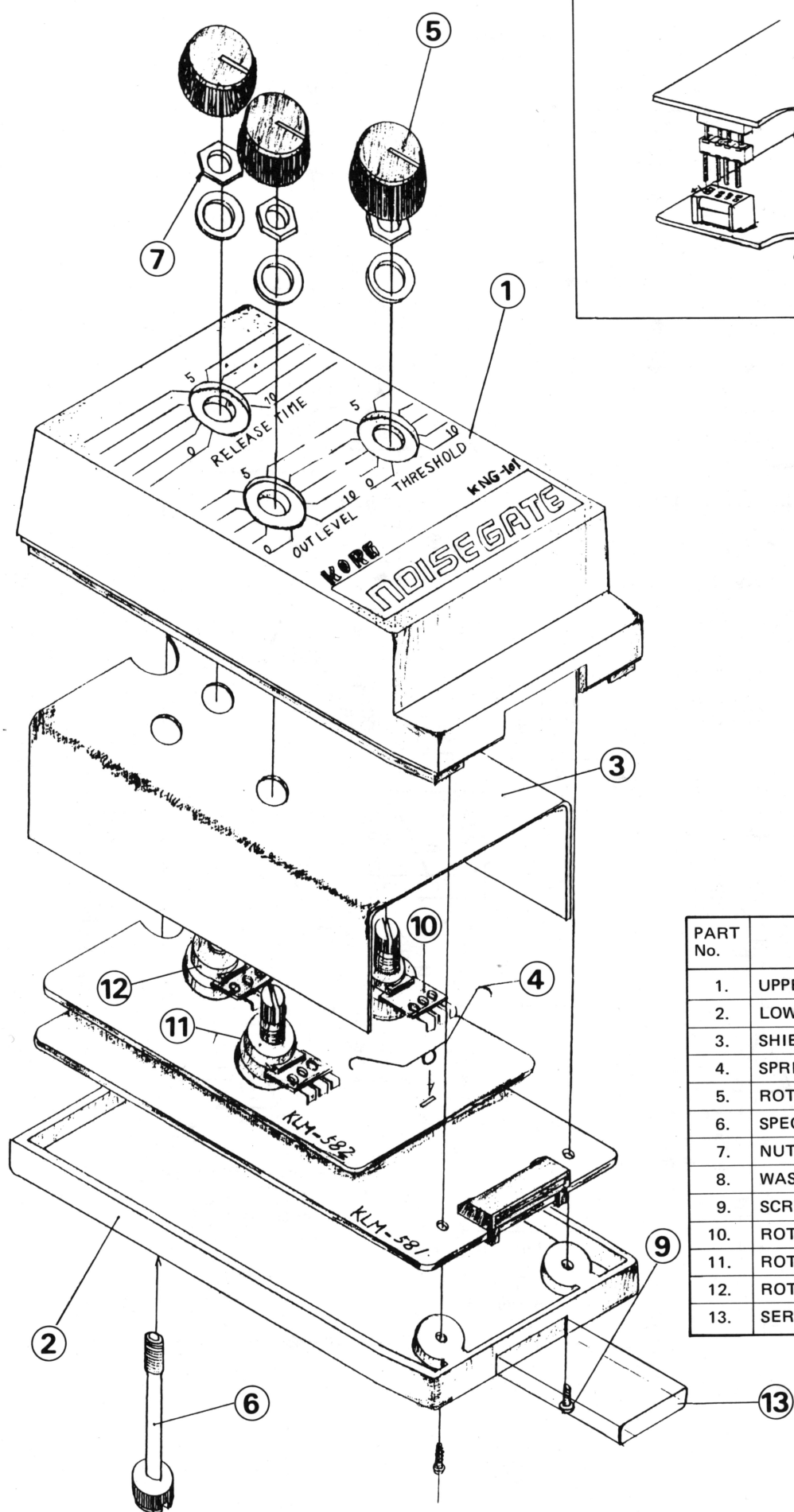
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6. PC BOARD	49
7. PARTS LIST	50



1. SPECIFICATIONS

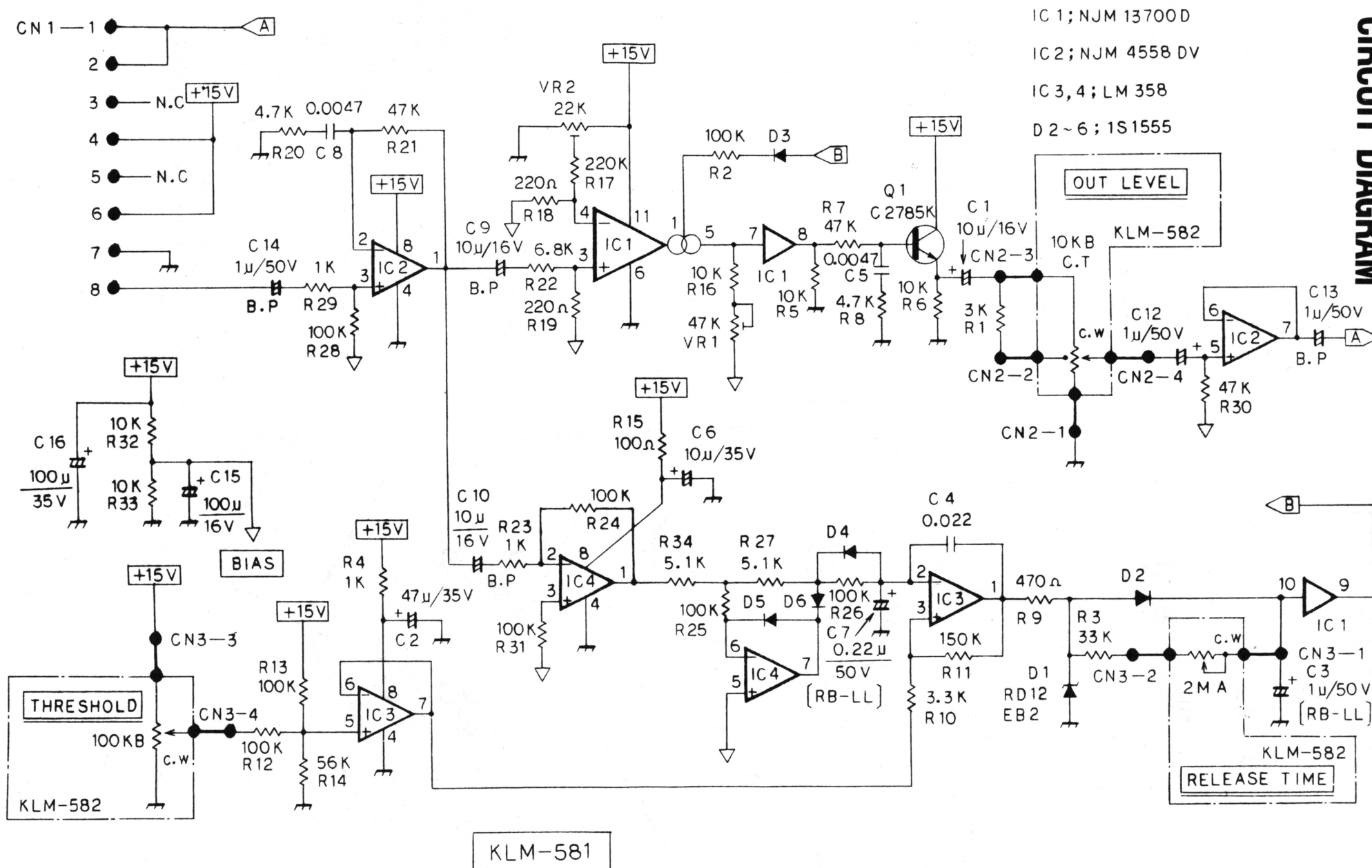
- **Maximum Input Level:** +3 dBm, at 250 Hz.
- **Maximum Output Level:** +4.5 dBm, at 250 Hz.
- **Threshold:** 0 ~ 31 mVrms(-28 dBm), at 250 Hz, THRESHOLD 0 ~ 10.
- **Attack Time:** 1 msec.
- **Release Time:** 34 msec ~ 2 sec, RELEASE TIME 0 ~ 10.
- **Frequency Response:** 20 Hz ~ 20 kHz, -3 ~ +0 dB, -20 dBm input.
- **Noise Level:** -98 dBm equivalent input noise IHF-A.
- **Dynamic Range:** 101 dB, at 250 Hz.
- **Power Consumption:** 9.8 mA, THRESHOLD 0 (Gate On).
- **Functions:** THRESHOLD, RELEASE TIME, OUT LEVEL, 8P JOINT CONNECTOR.
- **Power Supply:** DC 15 V (DC is supplied from the pedal-board.)
- **Dimensions:** 68.0(W) x 56.5(H) x 106.5(D) mm.
- **Weight:** 190 g. (All values are typical.)

2. STRUCTURAL DIAGRAM

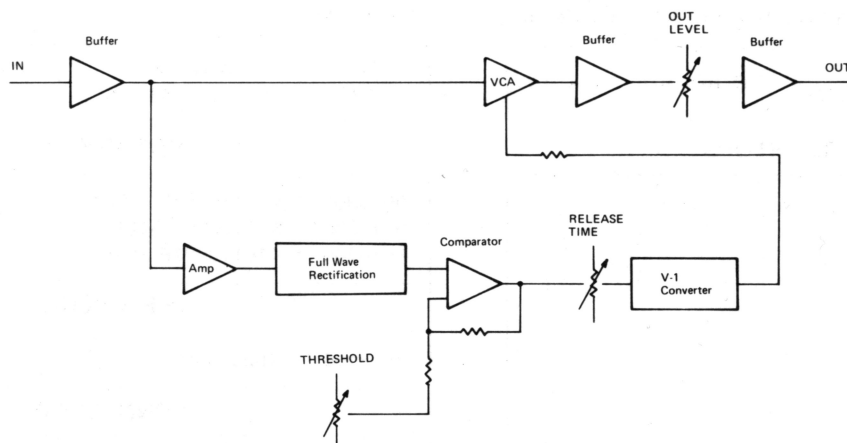


PART No.	PART NAME	REMARKS
1.	UPPER CASE	KOC-E20058
2.	LOWER CASE	KOC-E20062
3.	SHIELDING COVER	KOC-C40485
4.	SPRING	KOC-C40484
5.	ROTARY VR KNOB	KOC-E40138
6.	SPECIAL SCREW BN M4	KOC-E40488
7.	NUT	VM ZMC 7
8.	WASHER	WM ZMC 7
9.	SCREWS	PLAX B BZMC 3x10
10.	ROTARY VR	
11.	ROTARY VR	
12.	ROTARY VR	
13.	SERIAL NUMBER SEAL	KOC-F40050

3. CIRCUIT DIAGRAM



4. BLOCK DIAGRAM



5. ADJUSTMENT PROCEDURE

I. Before adjustment.

- Set knobs to these positions:
 THRESHOLD 0
 RELEASE TIME 0
 OUT LEVEL 0
- Test signal: 250Hz -23dBm sine wave.
- Test equipment: Low frequency oscillator (sine wave), AC voltmeter, Digital multimeter.

II. Adjustment.

1. VCA gain adjustment (VR1).

- a. Ground CN1-7 and connect CN1-4 to +15V.
- b. Connect low frequency oscillator (-23dBm) to connector CN1-8 and connect AC voltmeter to CN1-1.

c. Adjust VR1 to obtain a -20dBm reading on the AC voltmeter.

In other words, the unit should be adjusted so that small signal input/output = 0dB/+3dB. (Unity gain should be obtained at an OUT LEVEL knob setting of about 5.)

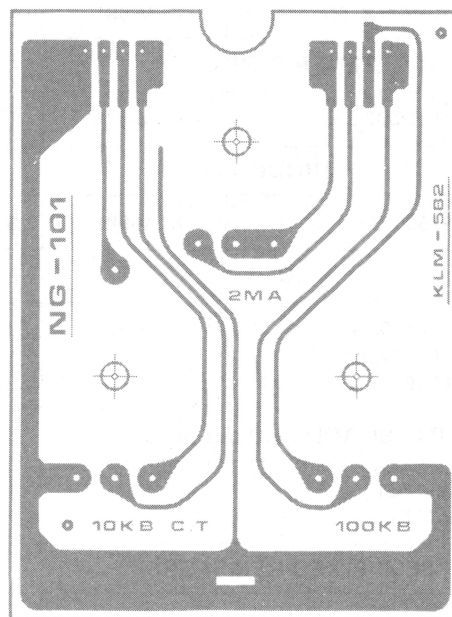
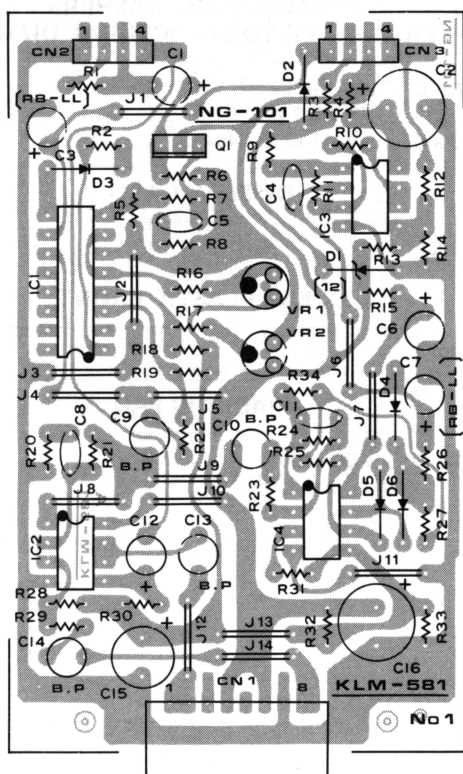
* It may take a while for output DC to stabilize because of AC voltmeter high impedance. If so, connect a resistor of about 100kohm in parallel with the AC voltmeter.

2. NJM13700D offset adjustment (VR2).

- a. Ground connector CN1-8.
- b. Adjust VR2 to obtain 0V for IC1 (NJM13700D) 5 pin ~ 1/2V_{cc} (BIAS) voltage.

* Adjustment to within ±20mV is sufficient.

6. PC BOARD



7. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS			
10416310	1/6JTP 100Ω	KLM-581	1
10416322	1/6JTP 220Ω		2
10416347	1/6JTP 470Ω		1
10416410	1/6JTP 1.0K		3
10416430	1/6JTP 3.0K		1
10416433	1/6JTP 3.3K		1
10416447	1/6JTP 4.7K		2
10416451	1/6JTP 5.1K		2
10416468	1/6JTP 6.8K		1
10416510	1/6JTP 10K		5
10416533	1/6JTP 33K		1
10416547	1/6JTP 47K		3
10416556	1/6JTP 56K		1
10416610	1/6JTP 100K		8
10416615	1/6JTP 150K		1
10416622	1/6JTP 220K		1
MYLAR CAPACITORS			
20402447	50V 0.0047μF K	KLM-581	2
20402522	50V 0.022μF K		1
ELECTROLYTIC CAPACITORS			
25403210	16V 10μF RE•T2	KLM-581	1
25403310	16V 100μF RE•T2		1
25405210	35V 10μF RE•T2		1
25405247	35V 47μF RE•T2		1
25405310	35V 100μF RE•T2		1
25406110	50V 1μF RE•T2		1
25426022	50V 0.22μF RB-LL•T2		1
25426110	50V 1μF RB-LL•T2		1
25463210	16V 10μF RBP•T2		2
25466110	50V 1μF RBP•T2		2
TRANSISTOR			
30420020	2SC2785 K TN	KLM-581	1
ZENER DIODE			
31101100	RD-12EB2 3%	KLM-581	1
DIODE			
31400100	1S1555 TP	KLM-581	5
IC			
32009001	NJM-4558D-V	KLM-581	1
32009026	NJM-13700-D		1
32021025	LM-358		2
P.C. BOARD (without parts)			
34058100	KLM-581		1
34058200	KLM-582		1
SEMI-FIXED RESISTORS			
35001322	H0651A 22KB	KLM-581	1
35001347	H0651A 47KB		1

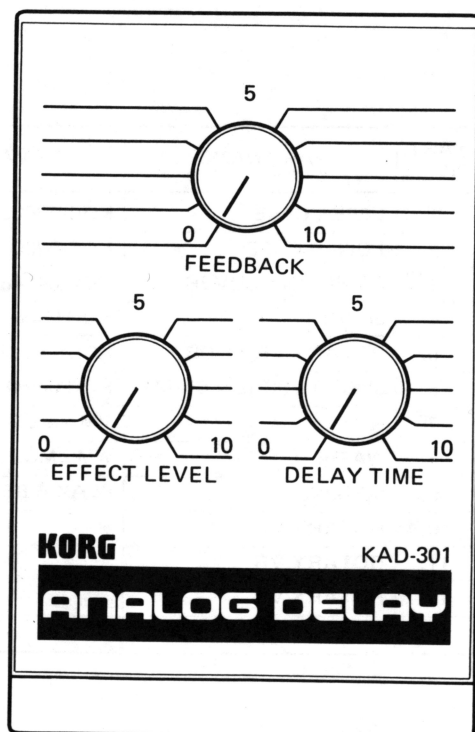
PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
ROTARY VR			
36015900	K161100P7E-100KB	KLM-582	1
36016600	K161100PDE-10KB		1
36016700	K161100P7E-2MA		1
8 PIN PLUG			
47408100	XI-2343 #01	KLM-581	1
CONNECTOR			
47408301	WD-2104 #01	KLM-582	2
47408600	SB4P-HVQ-55W JST	KLM-581	2
ROTARY VR KNOB			
62012000	KOC-E40138		3
SPRING			
64062000	KOC-C40484	KLM-582	1
SHIELDING COVER			
64062200	KOC-C40485		1
LOWER CASE			
64614600	KOC-E20062		1
UPPER CASE			
64614700	KOC-E20058		1
SERIAL NUMBER SEAL			
68599999			1
SCREWS, NUTS, WASHERS (PLEASE REFER TO STRUCTURAL DIAGRAM)			
74560310	PLAX B BZMC 3x10		2
77330700	VN ZMC 7		3
79120000	BN M4 KOC-C40488		1
DISPLAY CARD			
80008200			1
CLEAR PLASTIC FRONT			
80008201			1
PACKING PAD			
80008230	KOC-I40061		1

ANALOG DELAY

KAD-301

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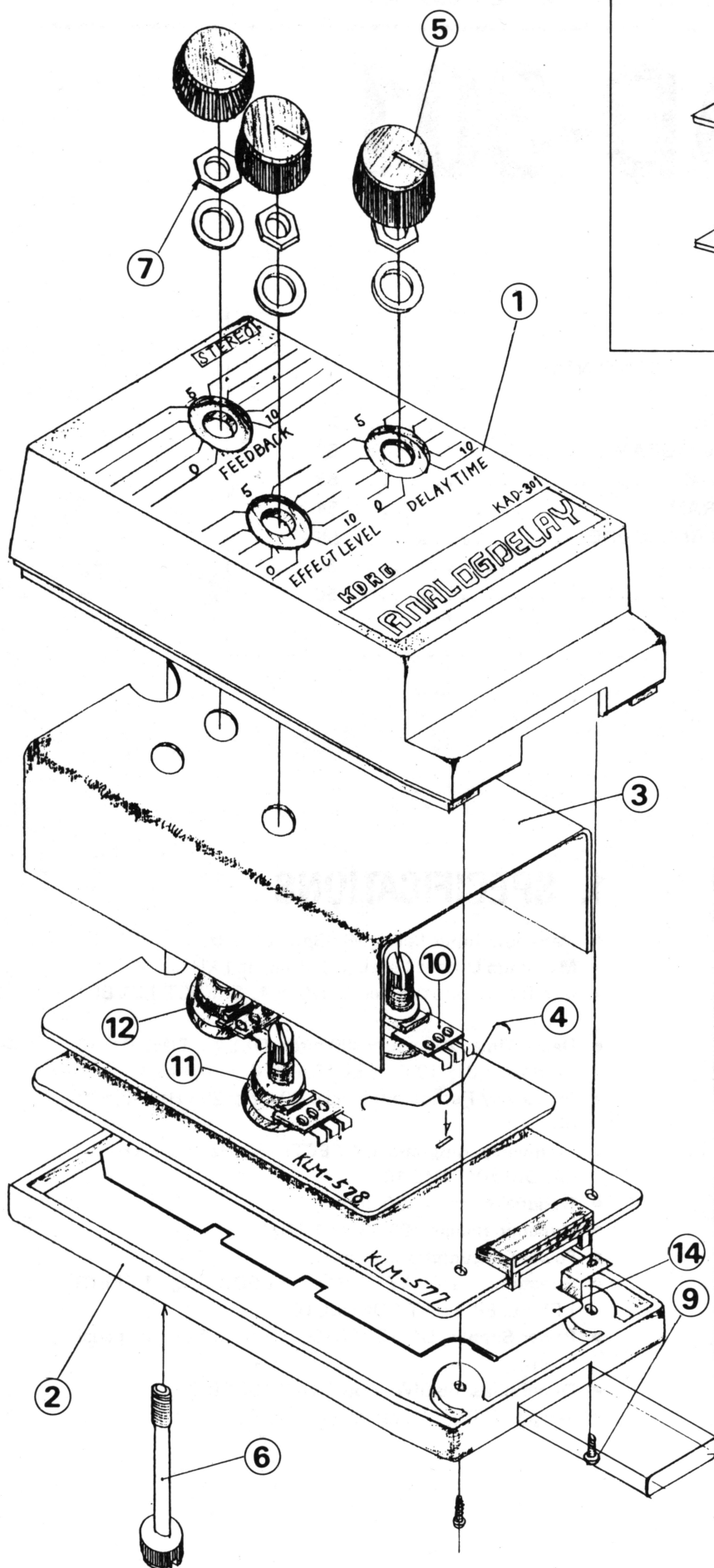
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7. PARTS LIST	56



1. SPECIFICATIONS

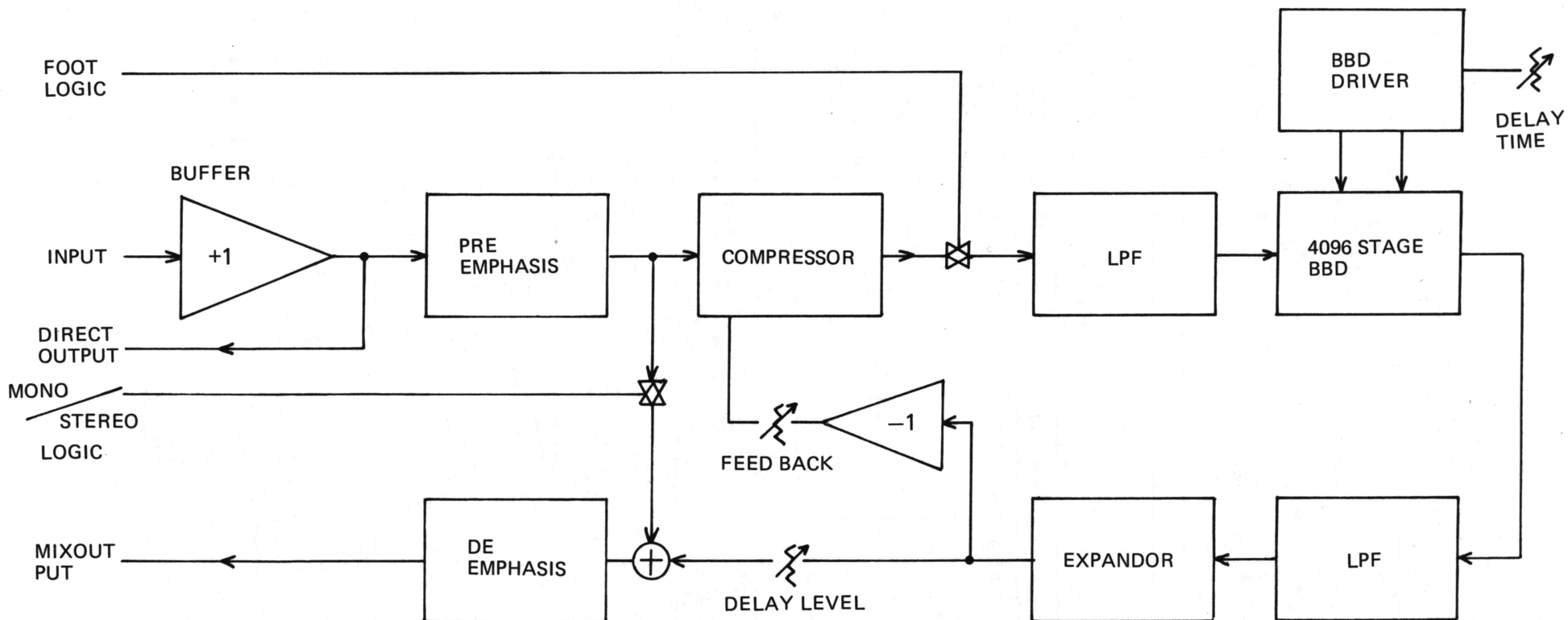
- **Maximum Input Level:** +8 dBm, at 1 kHz.
- **Maximum Output Level:** +12 dBm, at 1 kHz.
- **Mix Ratio:** Direct/Effect : 1/0 ~ 1, EFFECT LEVEL 0 ~ 10.
- **Delay Time:** 20 msec ~ 300 msec, DELAY TIME 0 ~ 10.
- **Feedback:** 0 ~ 100%, FEEDBACK 0 ~ 10.
- **Frequency Response (Direct):** 20 Hz ~ 20 kHz, -3 ~ +0 dB.
- **Frequency Response (EFFECT):** 30 Hz ~ 1.2 kHz, ±3 dB, DELAY TIME 10.
- **Residual Noise:** -100 dBm.
- **Dynamic Range:** 108 dB, at 1 kHz.
- **Power Consumption:** 28 mA.
- **Functions:** DELAY TIME, FEEDBACK, EFFECT LEVEL, 8P JOINT CONNECTOR.
- **Power Supply:** DC 15 V (DC is supplied from the pedal-board).
- **Dimensions:** 68.0(W) x 56.5(H) x 106.5(D) mm.
- **Weight:** 200 g. (All values are typical.)

2. STRUCTURAL DIAGRAM

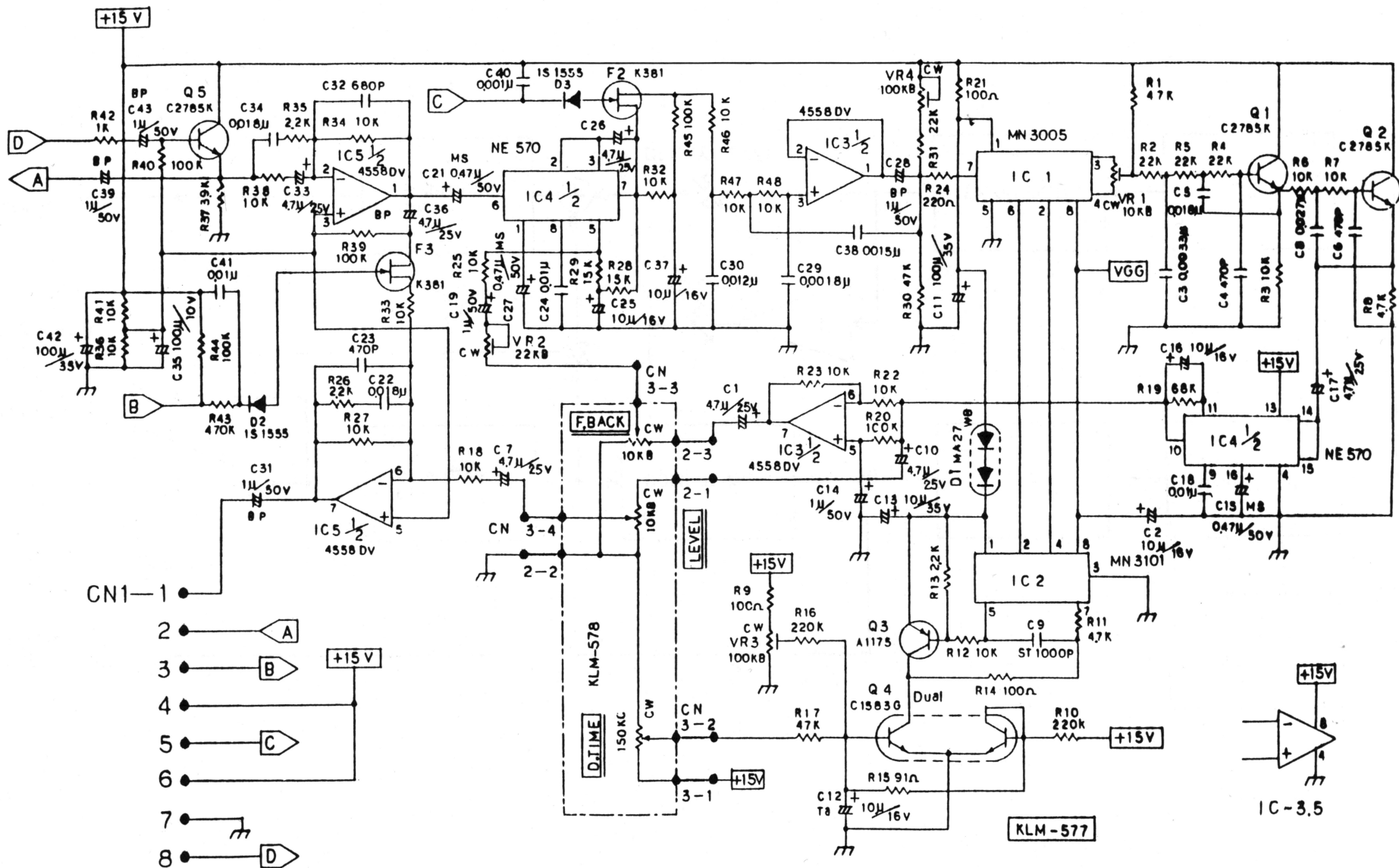


PART No.	PART NAME	REMARK
1.	UPPER CASE	KOC-E20058
2.	LOWER CASE	KOC-E20062
3.	SHIELDING COVER	KOC-C40485
4.	SPRING	KOC-C40484
5.	ROTARY VR KNOB	KOC-E40138
6.	SPECIAL SCREW BN M4	KOC-C40488
7.	NUT	VM ZMC 7
8.	WASHER	WM ZMC 7
9.	SCREWS	PLAX B BZMC 3x10
10.	ROTARY VR	
11.	ROTARY VR	
12.	ROTARY VR	
13.	SERIAL NUMBER SEAL	

3. BLOCK DIAGRAM



4. CIRCUIT DIAGRAM



5. ADJUSTMENT PROCEDURE

I. Before adjustment.

- Set knobs to these positions:

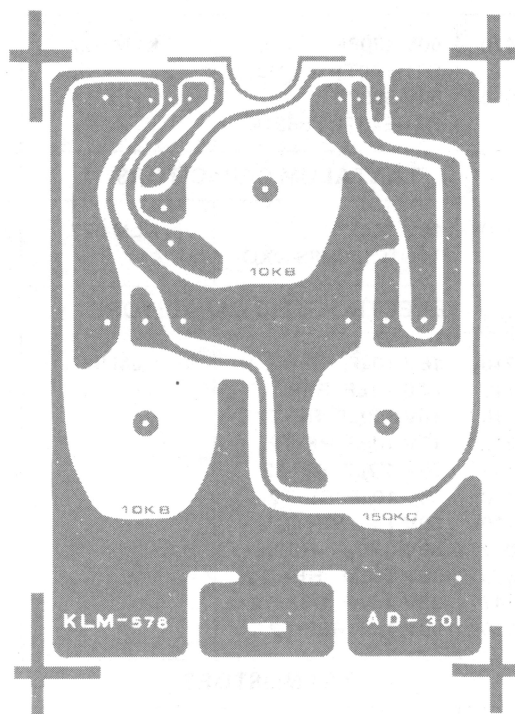
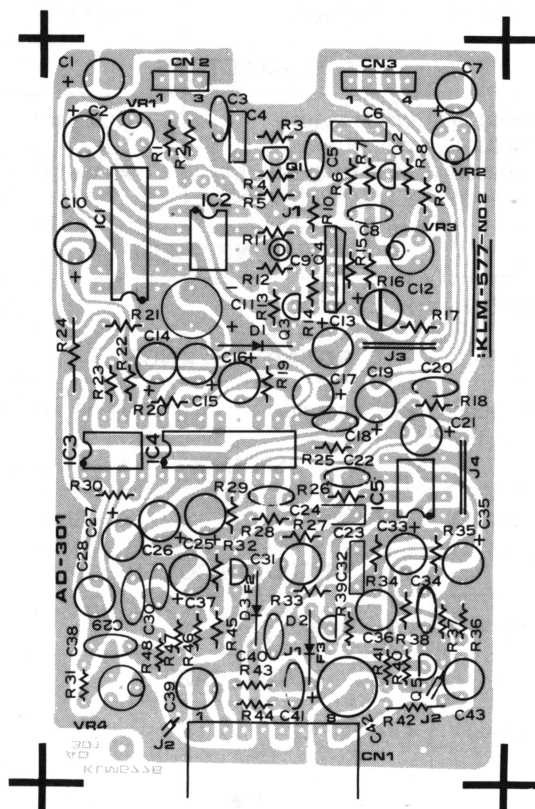
DELAY TIME	10
FEEDBACK	0
EFFECT LEVEL	any position
- Test signal: 440Hz sine wave.
- Test equipment: Frequency counter, Oscilloscope, Low frequency oscillator (sine wave).

II. Adjustment.

1. Clock frequency adjustment (VR3).
 - a. Ground CN1-7 and connect CN1-4 & CN1-5 to $\pm 15V$.
 - b. Connect frequency counter to IC1 (MN3005) 2 pin and adjust VR3 to obtain a clock frequency of 6.83kHz ($146.5\mu S$) $\pm 5\%$.
2. BBD bias adjustment (VR4).
 - a. Connect low frequency oscillator (at about +8dBm) to connector CN1-8. Check waveform at VR1 center pin and adjust VR4 to obtain a symmetrical upper and lower waveform pattern with minimum distortion and maximum amplitude.
3. Clock cancel adjustment (VR1).
 - a. Ground connector CN1-8.
 - b. Adjust VR1 to obtain minimum clock component at VR1 center pin.
4. FEEDBACK level adjustment (VR2).
 - a. Set knobs to these positions:

DELAY TIME	10
FEEDBACK	9
EFFECT LEVEL	10
 - b. Momentarily apply a 440Hz 0dB sine wave to connector CN1-8 and observe condition at CN1-1. Adjust VR2 so that the repeat sound under these conditions gets louder (doesn't attenuate), eventually reaching oscillation.

6. PC BOARD



7. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS			
10016410	1/6JY 1K	KLM-577	1
10416291	1/6JTP 91Ω		1
10416310	1/6JTP 100Ω		3
10416322	1/6JTP 220Ω		1
10416422	1/6JTP 2.2K		3
10416439	1/6JTP 3.9K		1
10416447	1/6JTP 4.7K		2
10416510	1/6JTP 10K		18
10416515	1/6JTP 15K		2
10416522	1/6JTP 22K		4
10416547	1/6JTP 47K		3
10416568	1/6JTP 68K		1
10416610	1/6JTP 100K		5
10416622	1/6JTP 220K		2
10416647	1/6JTP 470K		1
MYLAR CARACITORS			
20402410	50V 0.001μF K	KLM-577	1
20402418	50V 0.0018μF K		1
20402433	50V 0.0033μF K		1
20402510	50V 0.01μF K		3
20402512	50V 0.012μF K		1
20402515	50V 0.015μF K		1
20402518	50V 0.018μF K		3
20402527	50V 0.027μF K		1
STYROL CAPACITORS			
20502410	50V GT 1000PF	KLM-577	1
CERAMIC CAPACITORS			
21443470	50V 470PF RTHE90TKSL471J	KLM-577	3
21443680	50V 680PF RTHE40TKYB681K		1
TANTALUM CAPACITORS			
22407210	16V 10μF TPD1C100M8S-KXO	KLM-577	1
ELECTROLYTIC CAPACITORS			
23507210	16V 10μF RE	KLM-577	1
24515110	A50V 1μF RBP		1
25402310	10V 100μF RE•T2		1
25403210	16V 10μF RE•T2		3
25404147	25V 4.7μF RE•T2		6
25405210	35V 10μF RE•T2		1
25406110	50V 1μF RE•T2		2
25426047	50V 0.47μF RB-LL•T2		3
25435310	35V 100μF REA-T2		2
25464147	25V 4.7μF RBP•T2		1
25466110	50V 1μF RBP•T2		3
TRANSISTORS			
30201107	TR 2SC1583 G	KLM-577	1
30400020	TR 2SA1175 K TN		1
30420020	TR 2SC2785 K TN		3

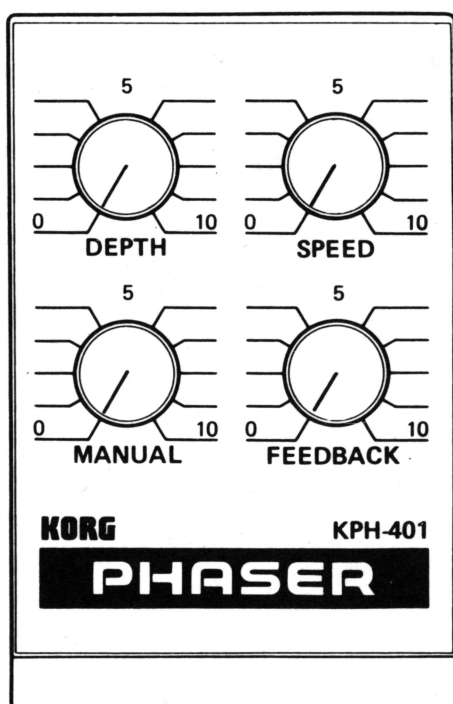
PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
FET			
30460021	FET 2SK381-34-C	KLM-577	2
DIODE			
31001200 31400100	MA27W-B 1S1555 TP	KLM-577	1 2
IC			
32002008 32002014 32009001 32025001	MN-3005 MN-3101 NJM-4558D-V NE-570	KLM-577	1 1 2 1
P.C. BOARD (without parts)			
34057700 34057800	KLM-577 KLM-578		1 1
SEMI-FIXED RESISTORS			
35001310 35001322 35001410	H0651A 10KB H0651A 22KB H0651A 100KB	KLM-577	1 1 2
ROTARY VR			
36016100 36016500	K161100P7E-150KC K161100P7E-10KB	KLM-578	1 2
8 PIN PLUG			
47408100	XI-2343 #01	KLM-577	1
CONNECTORS			
47408300 47408301 47408500 47408600	WD-2103 #01 WD-2104 #01 SB3P-HVQ-55W JST SB4P-HVQ-55W JST	KLM-578 KLM-577	1 1 1 1
SHIELDING SHEET			
58018003	KOC-F40279		1
ROTARY VR KNOB			
62012000	KOC-E40138	KLM-578	3
SPRING			
64062000	KOC-C40484	KLM-578	1
SHIELDING COVER			
64062200	KOC-C40485		1
LOWER CASE			
64614600	KOC-E20062	KLM-578	1

PHASER

KPH-401

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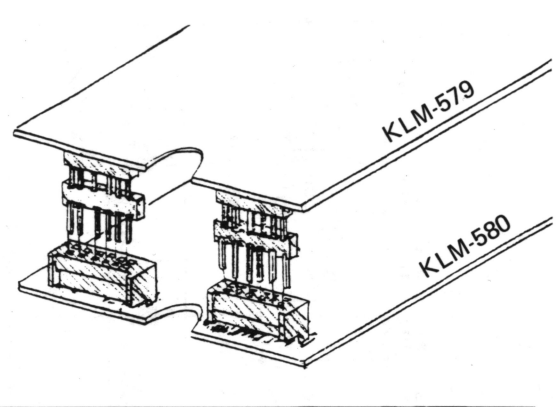
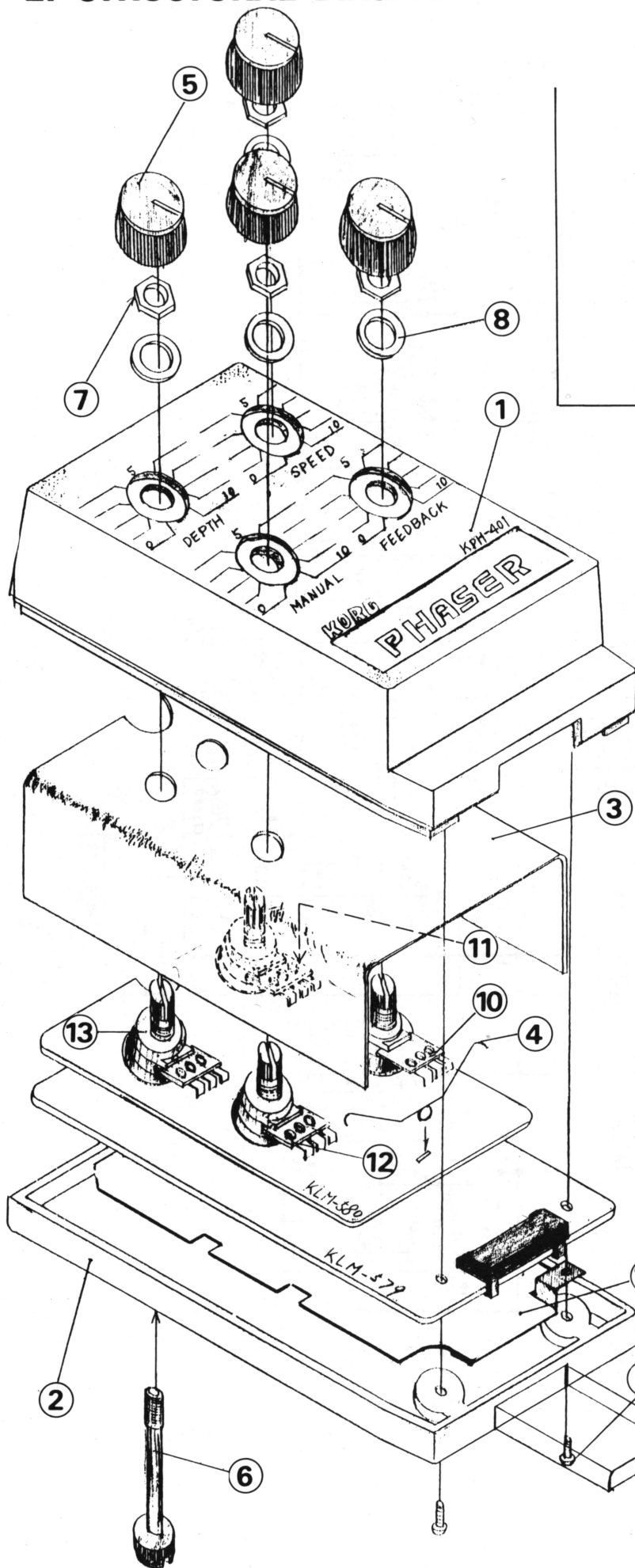
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1. SPECIFICATIONS

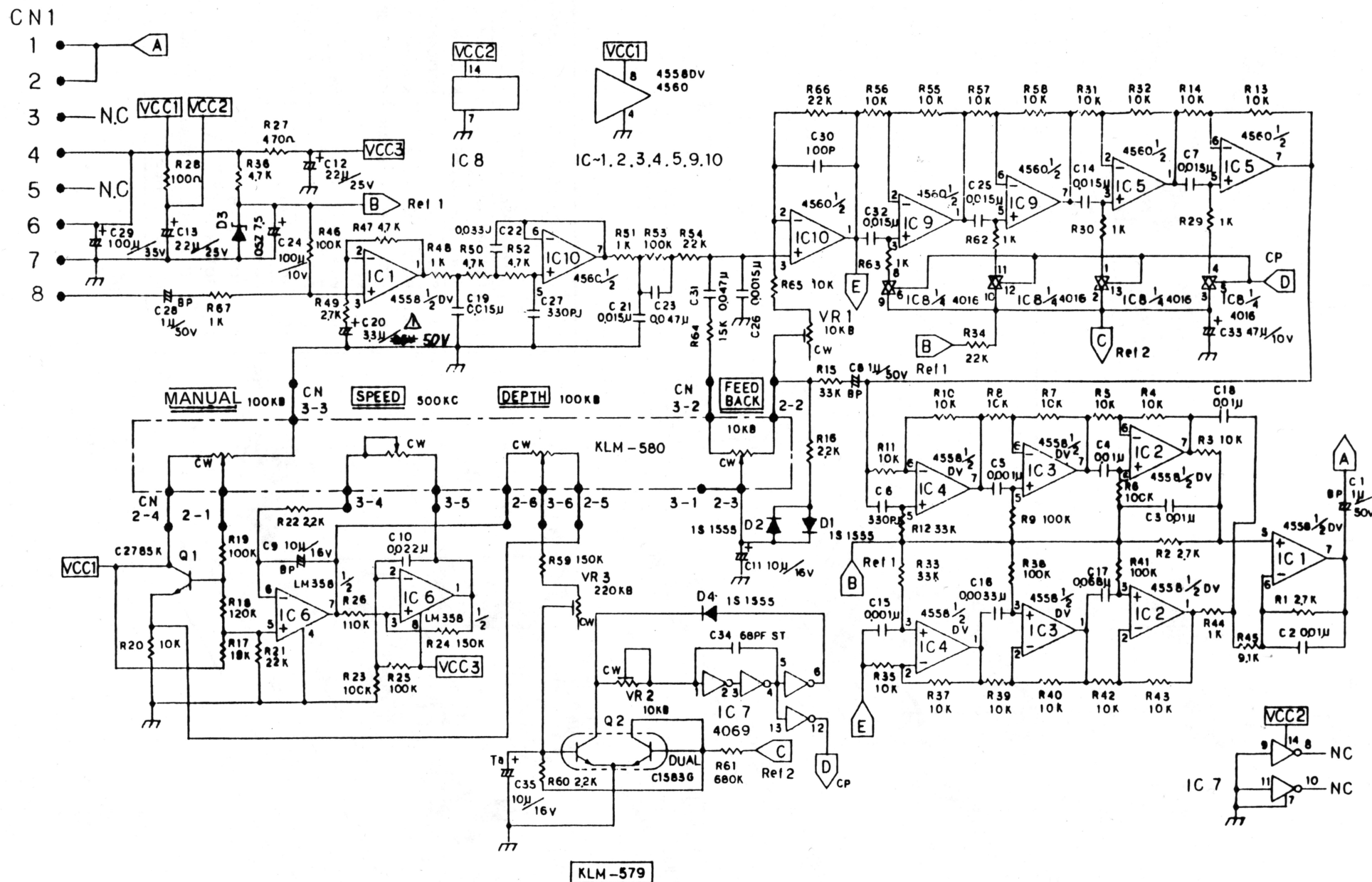
- Maximum Input Level: +4 dBm, 1 kHz.
- Maximum Output Level: +8 dBm, 1 kHz.
- Phase Shift: 720 degrees.
- Modulation Speed: 0.06 Hz ~ 10 Hz, Speed 0 ~ 10.
- Noise Level: -100 dBm equivalent input noise IHF-A.
- Dynamic Range: 104 dB, at 1 kHz.
- Power Consumption: 38.5 mA.
- Functions: SPEED, DEPTH, FEEDBACK, 8P Joint Connector.
- Power Supply: DC 15 V. (DC is supplied from the pedal-board).
- Dimensions: 68.0(W) x 56.5(H) x 106.5(D) mm.
- Weight: 210 g. (All values are typical.)

2. STRUCTURAL DIAGRAM

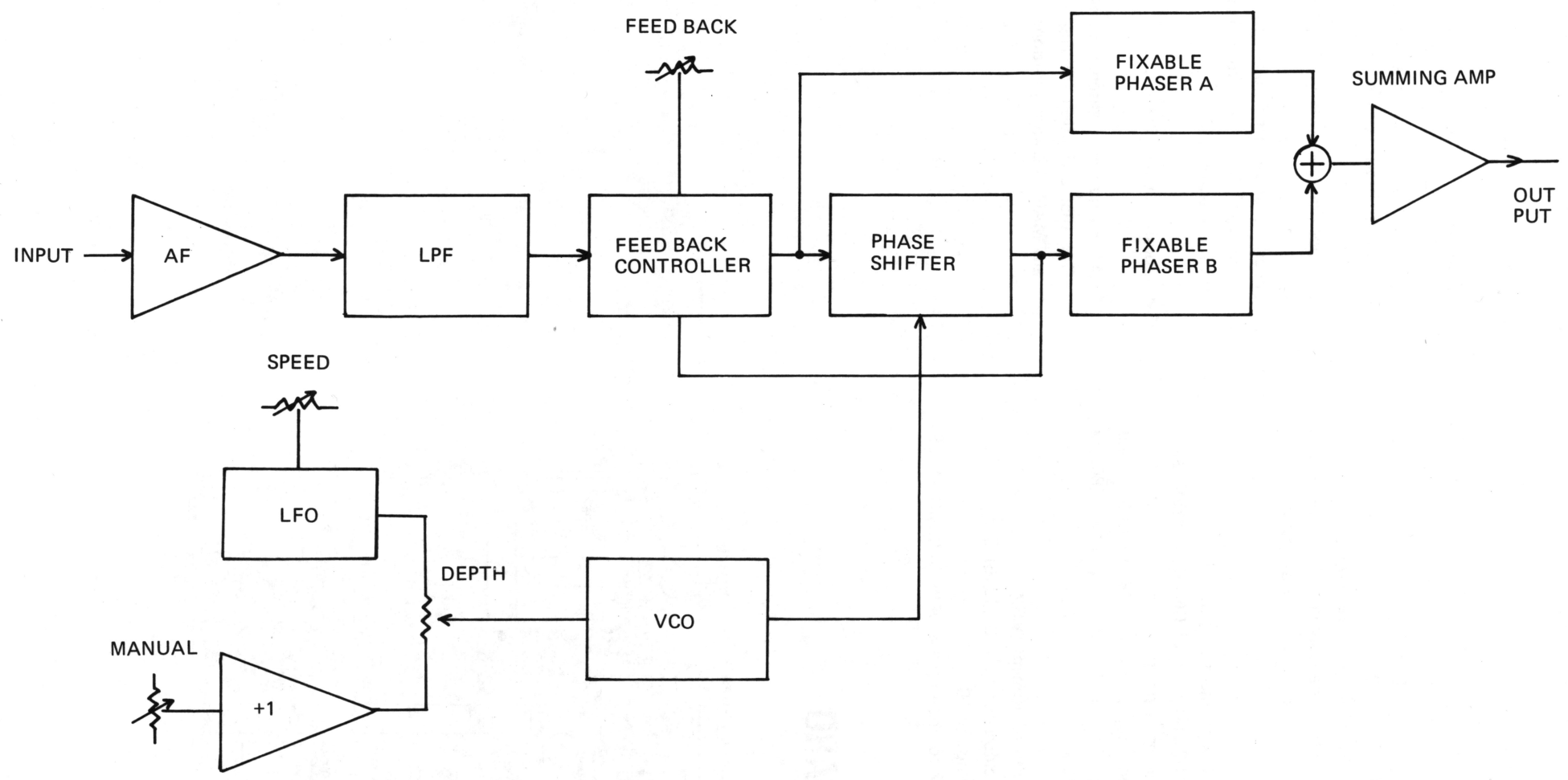


PART No.	PART NAME	REMARK
1.	UPPER CASE	KOC-E20058
2.	LOWER CASE	KOC-E20062
3.	SHIELDING COVER	KOC-C40485
4.	SPRING	KOC-C40484
5.	ROTARY VR KNOB	KOC-E40138
6.	SPECIAL SCREW BN M4	KOC-C40488
7.	NUT	VM ZMC 7
8.	WASHER	WM ZMC 7
9.	SCREWS	PLAX B BZMC 3x10
10.	ROTARY VR	
11.	ROTARY VR	
12.	ROTARY VR	
13.	ROTARY VR	
14.	SERIAL NUMBER SEAL	KOC-F40050
15.	SHIELDING SHEET	

3. CIRCUIT DIAGRAM



4. BLOCK DIAGRAM



5. ADJUSTMENT PROCEDURE

I. Before adjustment.

- Set knobs to these positions:

MANUAL	0
SPEED	0
DEPTH	0
FEEDBACK	0

- Test signal: 1kHz 2Vp-p square wave.
- Test equipment: Frequency counter, Oscilloscope, Low frequency oscillator.

II. Adjustment.

1. Clock frequency adjustment (VR3).

- Ground CN1-7 and connect CN1-4 to $\pm 15V$. Also set VR2 near center position.
- Connect frequency counter to IC8 (4016) 5 pin and adjust VR3 to obtain a clock frequency of 80kHz ($12.5\mu s$) $\pm 10\%$.

2. Clock pulse width adjustment (VR2).

- Connect oscilloscope to IC8 (4016) 5 pin and set MANUAL knob to 10.
- Adjust VR2 to obtain pulse width of $0.5\mu s \pm 0.1\mu s$.

3. FEEDBACK level adjustment (VR1).

- Connect low frequency oscillator (1kHz 2Vp-p square wave) to CN1-8 and observe output waveform at connector CN1-1.
- Adjust MANUAL knob so waveform looks like example in diagram below. (Fig. 2)

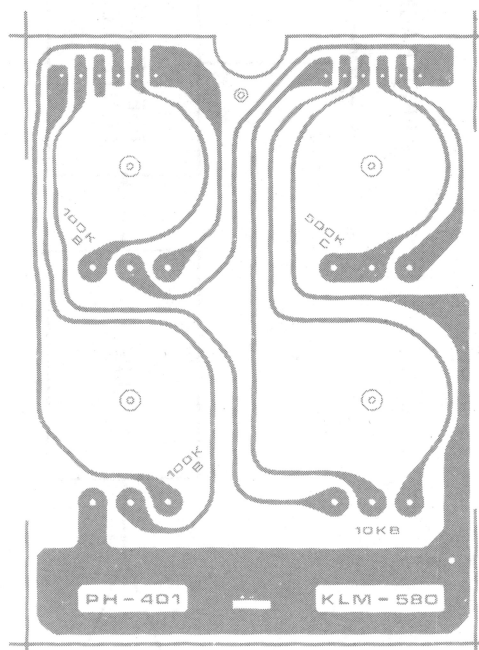
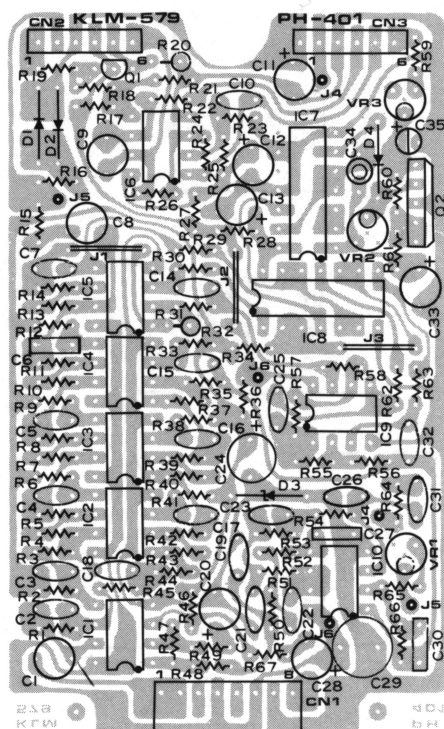
(Set to position that gives largest peak-to-peak value.)

- Under the above conditions and with FEEDBACK set to 10, adjust VR1 to obtain the waveform shown below. (Fig. 3)

(Set to position where $W1 = W2$.)

- * After adjustment, disconnect oscillator and confirm that oscillation (ringing) does not occur at any MANUAL knob position.

6. PC BOARD



7. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS			
10113510	S1/4JT 10K	KLM-579	2
10416310	1/6JTP 100Ω		1
10416347	1/6JTP 470Ω		1
10416410	1/6JTP 1.0K		8
10416422	1/6JTP 2.2K		4
10416427	1/6JTP 2.7K		3
10416433	1/6JTP 3.3K		1
10416447	1/6JTP 4.7K		4
10416491	1/6JTP 9.1K		1
10416510	1/6JTP 10K		21
10416515	1/6JTP 15K		1
10416518	1/6JTP 18K		1
10416522	1/6JTP 22K		3
10416533	1/6JTP 33K		2
10416610	1/6JTP 100K		9
10416611	1/6JTP 110K		1
10416612	1/6JTP 120K		1
10416615	1/6JTP 150K		2
10416668	1/6JTP 680K		1
MYLAR CAPACITORS			
20023515	50V 0.015μF K	KLM-579	1
20401533	50V 0.033μF K		1
20402410	50V 0.001μF K		2
20402415	50V 0.0015μF K		1
20402433	50V 0.0033μF K		1
20402510	50V 0.01μF K		4
20402515	50V 0.015μF K		5
20402522	50V 0.022μF K		1
20402547	50V 0.047μF K		2
20402568	50V 0.068μF K		1
STYROL CAPACITOR			
20502268	50V GT 68PF	KLM-579	1
CERAMIC CAPACITORS			
21443100	50V 200PF RTHE50TKSL101J	KLM-579	1
21443330	50V 330PF RTHE80TKSL331J		2
TANTALUM CAPACITORS			
22407210	16V 10μF TPD1C100M8S-KXO	KLM-579	1
ELECTROLYTIC CAPACITORS			
25402247	10V 47μF RE-T2	KLM-579	1
25402310	10V 100μF RE-T2		1
25403210	16V 10μF RE-T2		1
25404222	25V 22μF RE-T2		2
25406133	50V 3.3μF RE-T2		1
25435310	35V 100μF REA-T2		1
25463210	16V 10μF RBP-T2		1
25466110	50V 1μF RBP-T2		3

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
TRANSISTORS			
30201107 30420020	2SC1583 G 2SC2785 K TN	KML-579	1 1
ZENER DIODE			
31102800	05Z7.5Z	KLM-579	1
DIODE			
31400100	1S1555 TP	KLM-579	3
IC			
32004005 32004019 32009001 32009006 32021025	HD-14016 BP HD-14069 UBP NJM-4558D-V NJM-4560 D LM-358	KLM-579	1 1 4 3 1
P.C. BOARD (without parts)			
34057900 34058000	KLM-579 KLM-580		1 1
SEMI-FIXED RESISTORS			
35001310 35001422	H0651A 10KB H0651A 220KB	KLM-579	2 1
ROTARY VR			
36015900 36016200 36016500	K161100P7E-100KB K161100P7E-500KC K161100P7E-10KB	KLM-580	2 1 1
8 PIN PLUG			
47408100	XI-2343 #01	KLM-579	1
CONNECTOR			
47408302 47408700	WD-2106 #01 SB6P-HVQ-55W JST	KLM-580 KLM-579	2 2
SHIELDING SHEET			
58018003	KOC-F40279		1
ROTARY VR KNOB			
62012000	KOC-E40138	KLM-579	4
SPRING			
64062000	KOC-C40484	KLM-580	1
SHIELDING COVER			
64062200	KOC-C40485		1

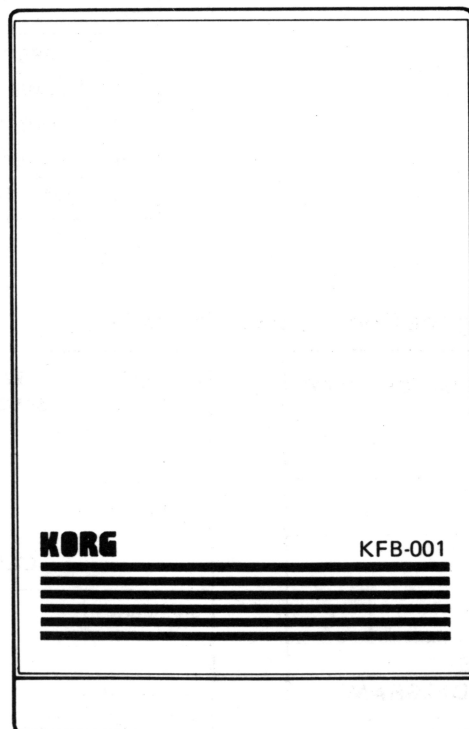
PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
LOWER CASE			
64614600	KOC-E20062		1
UPPER CASE A			
64615100	KOC-E20057		1
SERIAL NUMBER SEAL			
68599999			1
SCREWS, NUTS, WASHERS (PLEASE REFER TO STRUCTURAL DIAGRAM)			
74560310	PLAX B BZMC 3x10		2
77330701	VN ZMC 7		4
79120000	BN M4 KOC-C40488		1
DISPLAY CARD			
80008200			1
CLEAR PLASTIC FRONT			
80008201			1
PACKING PAD			
80008230	KOC-I40061		1

FILLER BOX

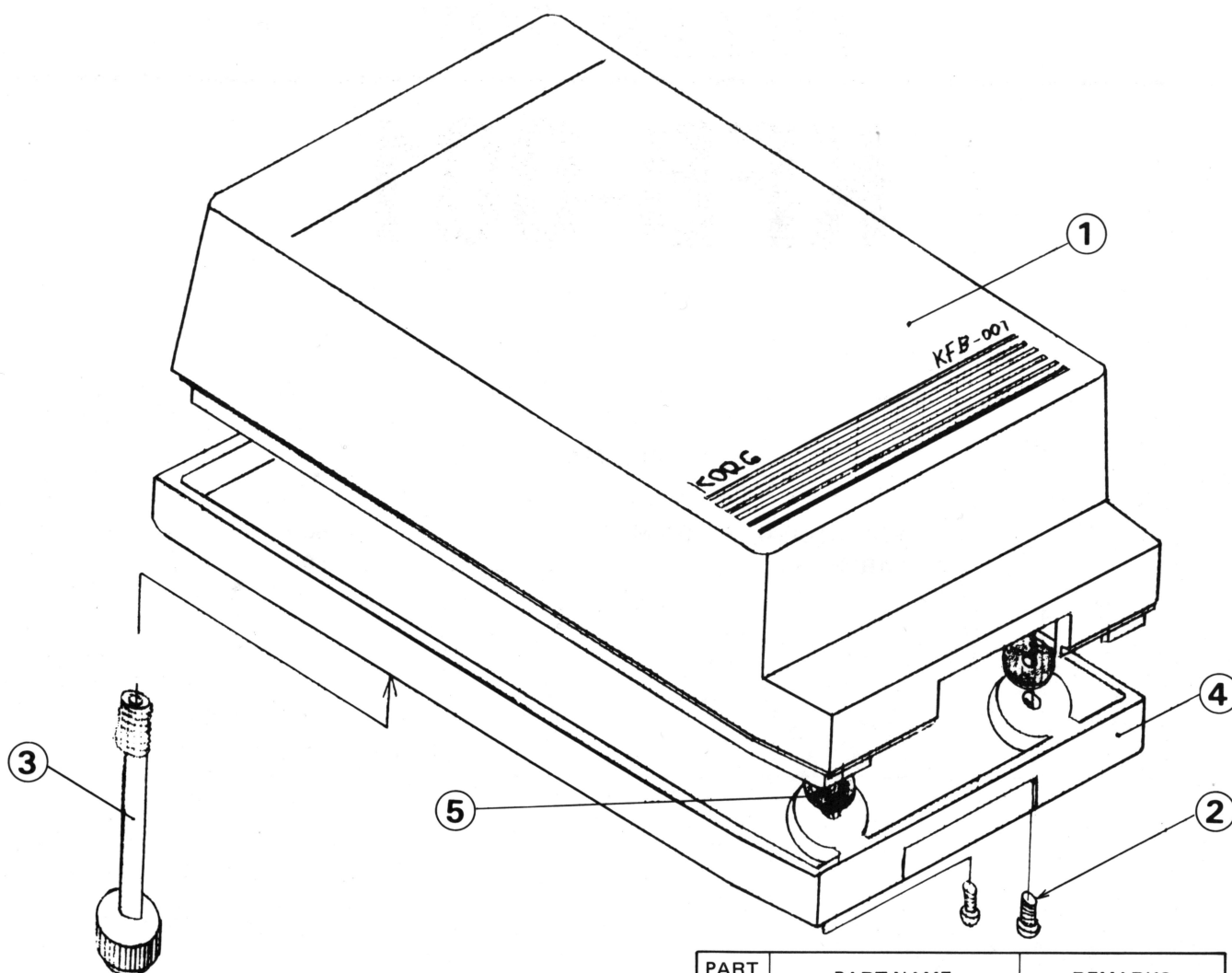
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1. STRUCTURAL DIAGRAM



PART No.	PART NAME	REMARKS
1.	UPPER CASE	KOC-E20058
2.	LOWER CASE	KOC-E20062
3.	SPECIAL SCREW BN M4	KOC-C40488
4.	SCREWS	PLAX B BZMC 3x10
5.	UNIT SPACER	KOC-E40140

2. PARTS LIST

(*) Please order following parts giving the Code numbers in the list.

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
UPPER CASE			
64613400	KOC-E20060		1
LOWER CASE			
64614600	KOC-E20062		1
SCREWS, NUTS, WASHERS (PLEASE REFER TO STRUCTURAL DIAGRAM)			
74560310	PLAX B BZMC 3x10		2
78590408	PCW 4x8x1.5		2
79120000	BN M4 KOC-C40488		1

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
DISPLAY CARD			
80008200			1
CLEAR PLASTIC FRONT			
80008201			1
PACKING PAD			
80008230	KOC-I40061		1

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